REPORT ON FINANCIAL STABILITY

November 2001

The Act on the National Bank of Hungary lays down the basic tasks of the central bank, which include promoting the stability of the financial system. To maintain and promote financial stability it is essential that the parties involved have access to a wide range of information on the financial system as a whole, its overall framework and the narrower and broader conditions for its operation. To this end, and in accordance with the practice of other central banks, the National Bank of Hungary publishes this semi-annual "Report on Financial Stability" in order to inform the professional public regarding the state of the country's financial intermediation system, the central bank's judgement of the system's stability and major domestic and international developments bearing on stability.

In the Report, the Bank seeks to publish the latest statistics, based on internationally applied methods, on the state and robustness of the financial system in a manner that enables comparison whenever possible. Furthermore, the Bank intends to provide a comprehensive analysis of the situation of the sectors participating in financial intermediation or exerting any influence over its stability, as well as of macroeconomic developments. In view of the fact that as a small, open country, Hungary has been closely integrated into the international flows of goods and capital, the Report gives separate coverage of those global cyclical and monetary developments that seem to bear relevance for financial stability.

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Introduction

The objective of the semi-annual "Report on Financial Stability", first published by the National Bank of Hungary in 2000, is to provide a comprehensive analysis of the major issues bearing directly and indirectly on Hungarian economic and financial stability, as well as to describe the main developments since the publication of the previous report, with particular regard to the potential risk factors that may threaten the efficiency of financial intermediation. Although this report essentially covers the first half of 2001, the chapter on macroeconomic developments also includes data and information on the latest developments up to the present.

This year has witnessed a number of important central bank measures with tremendous significance for financial stability. In agreement with the Government, the National Bank widened the fluctuation band of the exchange rate of the forint to ±15 per cent as of May 4th. Following this move, it abandoned the crawling peg regime as of October 1st. Adoption of an inflation-targeting framework was announced on June 12th, and the majority of the remaining foreign exchange restrictions were removed as of June 15th. In the wake of the band widening, the forint appreciated relative to the euro, and exchange rate volatility also increased markedly. In contrast to the exchange rate, short-term interest rates were characterised by very low volatility during the period between the introduction of inflation targeting and early September, implying that fluctuations in the risk premium were more typically reflected in exchange rate volatility.

As the overwhelming majority of Hungary's foreign trade is with European Union countries, it has been unfavourable for the Hungarian economy that the global slowdown triggered by lower growth in the United States and the long-standing weakness of the Japanese economy have noticeably affected the EU countries as well. In addition to poorer growth prospects, international capital markets are facing a decline in demand for higher risk investments, which is likely to exert downward pressure on non-Hungarian residents' portfolio investments, relative to the averages for previous years. However, the long-term capital inflow is expected to be higher than the current account deficit, which will decrease because of the slowdown.

The composition of household sector wealth has also changed considerably. First, household borrowing has increased rapidly over the past three years. Yet the ratios of borrowing to total wealth and interest charges to income remain low by international comparison. Thus, in the Bank's judgement, this restructuring – which is expected to continue over the longer term – will not pose a threat to financial stability. The share of higher risk instruments on the assets side of household portfolios has dropped. Due to the appreciation of the forint and the higher exchange rate risk, the proportion of foreign currency deposits has also plunged. Adverse developments in the prices of and yields on investments exposed to market risk have caused the weight of such investments to decrease within financial wealth. This

interrupted the trend seen over the past few years, with the proportion of investments outside the banking system remaining flat during 2001.

After rising quickly in recent years, corporate sector debt has now reached the level of several European countries. Longer-term debt shows a steadily increasing share among corporate liabilities, although still low by international standards. Corporate sector financial risk is exacerbated by the possibility that slower economic growth, stronger disinflation and nominal appreciation of the forint may reduce enterprises' nominal income growth, relative to expectations. The non-tradable sectors' high level of foreign-currency denominated debt is likely to increase such businesses' exchange rate risk over the longer term. This year, however, the stronger-than-expected forint will boost the non-tradable sector's profitability.

In the Bank's view, the sector of credit institutions continues to be stable, but its procyclical behaviour may pose a threat over the longer term, should there be a cyclical downturn. Recent factors mitigating the potential risks are that the increase in banks' regulatory capital has kept pace with the rise in credit risk, the fact that the banking sector appears to have sufficient capital strength, and that a solid ownership structure guarantees the availability of additional funds required by prospective growth.

In the first half of 2001, credit institutions' operations were characterised by the favourable tendencies first seen in 2000. Bank lending continued to expand at a rapid pace, just as in previous years. Banks responded to the appreciation of the forint and the increase in exchange rate volatility by cutting back on foreign currency lending and shifting towards forint-denominated lending. Experience from the most recent, very short period indicates that banks have been able to adapt smoothly to the aftermath of foreign exchange liberalisation and the changes in the exchange rate system. Nevertheless, a more in-depth analysis of the implications will require observations over a longer period of time.

Buoyant lending growth was equally characteristic of banks' retail and corporate business lines. We consider it a welcome sign that market segments with very high exposure to the emergence of bubbles do not account for a high share of banks' lending activities. As a new trend within lending to individuals, lending for housing purposes is expanding at a rate which increasingly exceeds consumer credit growth. The expansion in lending has not led to deterioration in the quality of the credit portfolio. The first six months also saw a decrease in the banking sector's exposure to market risks. In addition, banks' operations continued to improve in profitability and cost-efficiency.

Institutional investors, such as investment funds, pension and health funds and insurance companies, continued to increase their combined share within the total financial sector, thanks essentially to a rapid rise in savings deposited with pension funds. Institutional investors' portfolios, traditionally managed conservatively, continued to be characterised by a high level of risk aversion during the first half of the year, with the share of corporate equity and bond investments down within the portfolios at all three types of institutions.

The first study published with this report deals with the extent of the protection that banking sector capital provides in the event of exceptional market risks and major deterioration in the credit portfolio. The stress test draws heavily on the methods described in the study published in the February 2001 Report on Financial Stability. In fact, it is an advanced version of this, updated with data through the end of 2000. The other study reviews the state of and risks faced by the Hungarian payment system, as well as the new challenges facing the VIBER (RTGS) system.

Henrik Auth
Vice President

1 Macroeconomic and capital market environment

The global business cycle

The international business cycle affects Hungarian financial stability through the balance of foreign trade in goods and services (the current account) and capital flows (the financial account[1]). On the one hand, to a significant extent these factors define the profitability of the international trading sector, which is very important in terms of judging foreign exchange liabilities-related repayment risk, while they also influence other risk factors due to their impact on the real exchange rate of the forint. On the other hand, as the Hungarian economy relies heavily on external financing, international capital flows directly affect domestic financial stability.

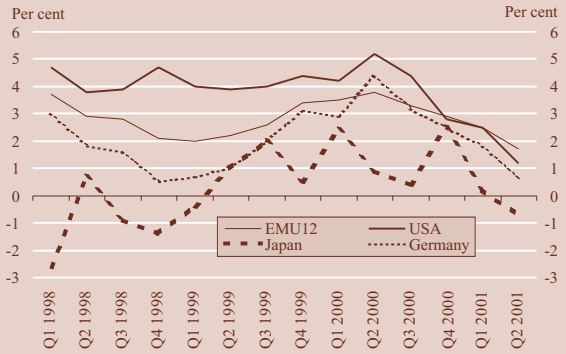
Over two thirds of Hungarian foreign trade is conducted with the European Union, and most specifically with EMU members. Therefore, this channel primarily transmits to the Hungarian economy those global developments that have an impact on the EU, with special regard to the monetary union. Economic activity in other areas of the world also generally affects Hungary via the EU.

The global slowdown in 2001, due to the decline in the United States and persistent sluggishness in Japan, has clearly had an effect on the euro area (see Chart 1.1).

Projected economic growth for 2001 declined significantly, and despite the closed-nature of the euro area economy, the relative weakness of the euro and strong domestic demand, it will fall short of the long-term rate of 2–2.5 per cent, estimated by the ECB in June (see Table 1.A). The slowdown in inflation allows the euro area to further ease monetary policy. The ECB reduced interest rates by 100 basis points until end-October, and market participants are expecting further interest rate changes.[2] In addition to this, a slight fiscal easing will also improve growth prospects. By contrast, a possible decline in financial wealth and a fall-off in external demand will act as a brake on the European economy.

Due to slower inflation and tax cut measures passed in most European countries, economic growth in 2002 is expected to fall within the estimated potential range of 2.0–2.4 per cent, forecast not only by the IMF, but by major international investment banks as well. Although the euro area is affected by the global

Chart 1.1 **Real GDP growth**
Annualised, seasonally adjusted rates



Source: OECD

Table 1.A **Real GDP growth rates in certain regions**

Per cent

	1999	2000*	2001*	2002*
World Economic	3.6	4.7	2.6	3.5
Euro area	2.7	3.5	1.8	2.2
United States	4.1	4.1	1.3	2.2
Japan	0.8	1.5	-0.5	0.2
Central and Eastern Europe	2.0	3.8	3.5	4.2
Latin America	0.2	4.2	1.7	3.6

Source: IMF (2001): World Economic Outlook October.
* Projection.

[1] From 1996, the contents of the capital account have changed completely relative to the previous period. Under the new methodology, capital transactions are included within the financial account.

[2] Based on the spot and future interest rate spread on the three-month EURIBOR. Source: http//www.liffe.com. Analysts interpret this difference as the market's expectations of the ECB's interest rate changes.

slowdown, it is expected to re-embark a long-term growth path sooner than the United States, which is not only threatened by sluggish growth but even a recession, according to a number of analysts.

Although the slowdown in the USA and Japan has only had a limited effect so far, thanks to the closed nature of the euro-area economy, should a worse-than-expected scenario occur in America, this would make the feed-through of further effects likely, first of all to financial markets. This is because a drop in financial asset prices may further reduce aggregate demand and prompt investors and companies to cut back on spending, the former as a result of the wealth effect and the latter because of the increased capital cost of investment. Nevertheless, the impact of this channel in the euro area is not considered to be as powerful as in the United States, since in the euro area the importance of the stock exchange (the degree of capitalisation) lags far behind that of the US, which makes the stock market exposure of the household and corporate sectors much lower. Furthermore, the crisis in the information technology sector is probably less of a problem in the euro-area countries, since the share of the "new economy" within GDP is smaller than it is in the United States.

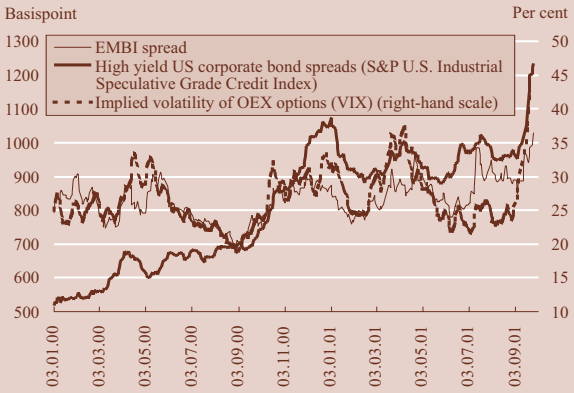
Risk perception in international financial markets

International capital market developments and the global appetite for risk exert significant influence over the direction of capital flows and returns on domestic financial assets, and thus ultimately on financial stability. Fears of a slowdown in global growth have been adding to uncertainty on the capital market since the second half of 2000, leading to a revaluation of risks. This has been reflected in a world-wide fall in share indices and an upward shift in global risk indicators (see Box 1.1).

Over the past one and a half years, the risk perception of emerging markets has been influenced exceptionally strongly by the developments in advanced markets, in particular by the business cycle and stock market prices. This is indicated by the fact that the EMBI spread,[3] which reflects emerging country risk, has moved in parallel with riskier corporate bond spreads in developed countries and the implied volatility of American index options (see Chart 1.2).

The path of the EMBI spread has also been governed by changes in the risk perception of certain emerging markets. In early July, the nearly simultaneous appearance of unfavourable news about the financial and economic situations of three emerging countries – Argentina, Turkey and Poland – caused a sharp rise in the EMBI spread. The spread on Hungarian foreign currency bonds followed this rise in the EMBI spread to a minor extent. Thus, Hungary was affected by contagion: in early July and mid-August this caused depreciation of a few percentage points in the forint's exchange rate and a drop in foreign investors' demand for government securities.

Chart 1.2 **Global risk indicators**



[3] JP Morgan's Emerging Markets Bond Index+ (EMBI+) consists of spreads of dollar-denominated emerging country sovereign bonds over US treasury bond yields. The EMBI+ is thus an indicator of perceived risk associated with emerging countries.

Box 1.1 Risk indicators of international capital markets

During an economic boom, prices of risky financial assets increase at a faster pace than those of less risky ones, reflecting stronger confidence and increased demand for high-yield investments. When the business cycle reaches a turning point and the economy slows down, more and more investors focus on safer investments, and there is a flight to quality (e.g. increased investment in government securities issued in developed countries), with investors refusing to undertake risk unless higher returns are offered, which is consequently reflected in higher risk premia.

Changes in the global appetite for risk also affect higher risk investments in developed capital markets (such as US equities, higher-risk corporate bonds), and government bonds, which play a key role in financing emerging countries, as they are given more or less the same risk rating. Therefore, it is worth examining developed market risk indicators, as this may provide a more detailed picture of the subtleties behind the spreads on emerging country sovereign bonds.

The EMBI spread is a standard indicator of emerging country risk. It is the sum of the spreads on these countries' dollar-denominated government debt in excess of US Treasury bond yields. At the same time, as the EMBI spread reflects an average, it can only convey an incomplete and often misleading picture of international investors' appetite for risk. Therefore, it does not allow us to distinguish between changes in risk perception involving certain regions and those involving emerging markets in general. The risk perception of the countries covered by the index varies across a wide range, with countries representing a higher element of risk having a higher weight. This is why it occurs on occasion that an increase in one country's credit risk causes the index to rise (as in April 2001, for example).

An analysis of the indicators listed below together with the EMBI spread may provide a better starting point for distinguishing between which effects on the general perception of emerging countries originate from the developed or the emerging markets.

Implied volatility of equity indices

As volatility indices computed from equity options prices reflect investors' judgement of the riskiness of a particular equity, the volatility implied by various stock-market index options gives a clear idea of the uncertainty prevailing in a specific market. The Volatility Index (VIX) shown in Chart 1.2 is the weighted average of the volatility rates implied by the Standard & Poor 100 call and put options. As the S&P 100 options are the most liquid index options on the American capital market, the VIX is a good approximate indicator of the American equity market as a whole.

Corporate bond spreads

Junk bond spreads give a good indication of financial conditions, and experience suggests that they also are early indicators of the state of the business cycle. A rise in corporate bond spreads indicates a deterioration in the economic prospects of less creditworthy companies as well as a decline in investors' willingness to take risk. Standard & Poor's high-risk corporate bond index in Chart 1.2 shows the yield difference between a portfolio of non-investment grade US corporate bonds relative to US treasury bonds of a similar maturity.

The terrorist attack on the USA on September 11th drastically reduced global investors' willingness to undertake risks, further aggravating fears of a world-wide recession (see Chart 1.3). Developed-market risk indicators reached historic highs, and simultaneously with a plunge in developed market share indices, the relative perception of the risk involved in emerging market financial assets deteriorated, also reflected in a sharp rise in the EMBI spread. Following the terrorist attack, the forint's exchange rate depreciated, while the interest premium on Hungarian foreign currency bonds rose, along with the yields on forint-denominated government securities.

The events from July to September highlighted the fact that, despite the significant improvement in Hungary's credit rating over the past few years, international investors in the Hungarian money and capital markets are still very sensitive to adverse developments in emerging markets. In addition to this, a rise in the interest premium on Hungarian financial instruments can be expected, even when the shocks originate from developed countries. This is mainly reflected in exchange rate movements, which now fluctuate within a wide band, and to a smaller extent, in a rise in the volatility of forint yields.

Chart 1.3 **EMBI spread and three-year zero coupon yields**

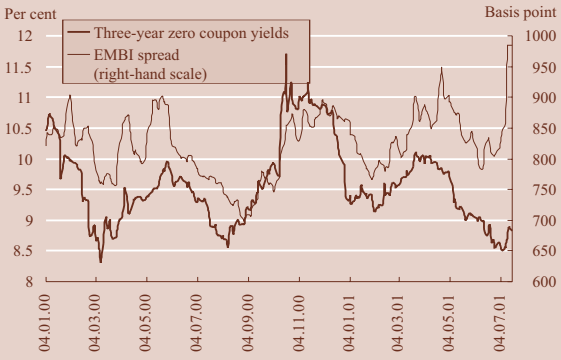
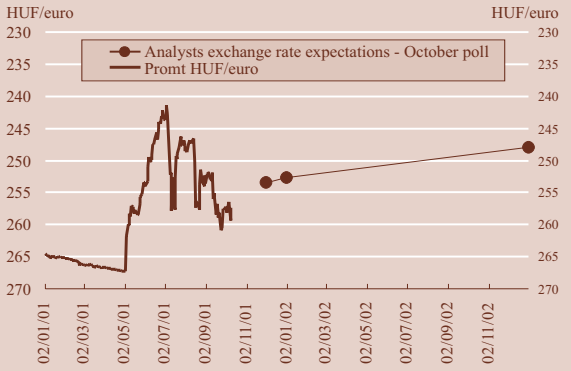


Chart 1.4 HUF exchange rate and analysts' expectations



Source: Reuters analysts' expectations

Chart 1.5 Volatility of the forint's exchange rate
20-day weighted moving averages

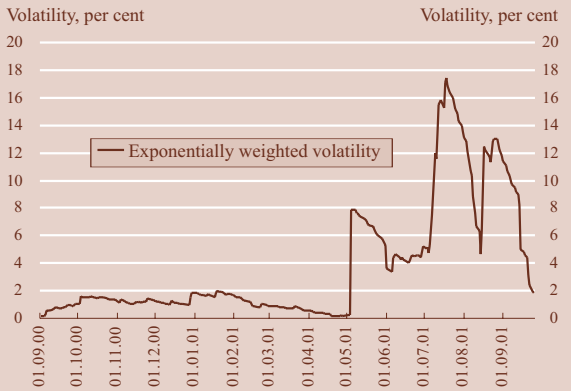


Table 1.B Average daily turnover
Spot and derivatives transaction

HUF billions

	2001			
	Jan.–May	May–June	June–July	July–Sep.
Forex/Forex	137	87	79	104
HUF/Forex	90	144	**300**	**257**
Total	227	231	378	361

Source: NBH

Domestic macroeconomic conditions

Financial asset prices

Changes in the forint exchange rate and capital flows

The forint's exchange rate risk is a key factor from the aspect of financial stability. The widening of the exchange rate band on May 4th had a fundamental impact on the expectations regarding the future exchange rate. In the aftermath of the measure, the forint appreciated, increasing in volatility at the same time. The periods with higher volatility have been associated with a loss of confidence in emerging countries. Experiences since the band was widened indicate that despite the favourable situation of the Hungarian economy, the exchange rate of the forint is quite sensitive to negative capital market news involving emerging countries. The over 10 per cent exchange rate volatility of the forint seen over the past few months[4] (see Chart 1.5) is broadly identical with the extent of exchange rate fluctuations of the Polish zloty. Despite the higher exchange rate volatility, analysts' expectations suggest that market participants are confident of a strong forint over the longer term, expecting the exchange rate to be around 248 forints to the euro in December 2002 (see Chart 1.4).

The liquidity of foreign exchange forward markets and interbank foreign exchange markets is a key factor in stability. In the period from the band widening to the end of August, the average value of open contracts in the foreign exchange forward markets remained unchanged at HUF 50–70 billion. In the wake of the band widening and foreign exchange liberalisation, interbank foreign exchange trading picked up almost instantaneously.[5] This is reflected in banks' daily reports to the National Bank (see Table 1.B). The proportion of transactions with foreign customers rose from 28 per cent to 60 per cent, while the proportion with non-bank residents (firms) remained unchanged. The inference is that the driving force behind growth is not as of yet the resident corporate sector. Nevertheless, this is a hopeful sign since by promoting the development of the market it may pave the road for the involvement of corporate clients.

Another indicator of market liquidity is the difference between bid and offer prices. Short-term changes in the spread reflect foreign exchange related risks (while, over the longer term,

[4] We have estimated exchange rate volatility as a 20-day exponentially weighted moving average of the variance derived from the annualised logarithmic change of the exchange rate. Compared with the simple moving average (computed using identical weights), this index can better show the effect of immediately preceding days, while the effects of days that are further away in time "fade away" sooner. This method is used to pinpoint a characteristic feature of financial markets, namely that volatility is concentrated over certain intervals. In other words, if volatility is high on the day preceding the day under review, then it will very likely remain so on the day under review. At the same time, we are able to prevent volatility of the days followed by less volatile market days from affecting the average for too long. For more on this, see the chapter Risk Modeling of Financial Instruments in J.P. Morgan: The RiskMetrics Technical Document.
http://www.riskmetrics.com/research/techdoc/index.cgi?intro.html#rmtd

[5] The turnover boosting effect of the band widening and foreign exchange liberalisation must have become even more pronounced when a measure affecting banks was scrapped in June 2001. According to this measure, the National Bank sanctioned commercial banks' open on-balance-sheet foreign exchange positions in excess of a certain level by paying a reduced rate of interest on required reserves after May 2000.

the spread is also influenced by changes in the intensity of market competition and other structural factors, such as the recent widening of the exchange rate band and foreign exchange liberalisation). Interbank foreign exchange market spreads also reflected the increased uncertainty in the aftermath of the Argentine crisis. Although the spread narrowed somewhat after the crisis, it did not return to its low pre-crisis level and continued to show great sensitivity to adverse news, with particular regard to the terrorist attacks against the US. Thus, the spread is likely to continue fluctuating across a wide range in the future (see Chart 1.6).

Following the announcement of the band widening, non-residents' government security holdings rose by roughly HUF 150 billion before peaking on July 5th. The increase in demand was largely focussed on long-term government securities (see Chart 1.7). However, Hungary did not remain unscathed by the impact of the adverse change in the perception of emerging markets in early July, when non-resident investors' previously stable demand for forint assets dried up, prompting a decrease of over HUF 90 billion by end-September. This drop primarily affected maturities of less than one year as well as of two to three years.

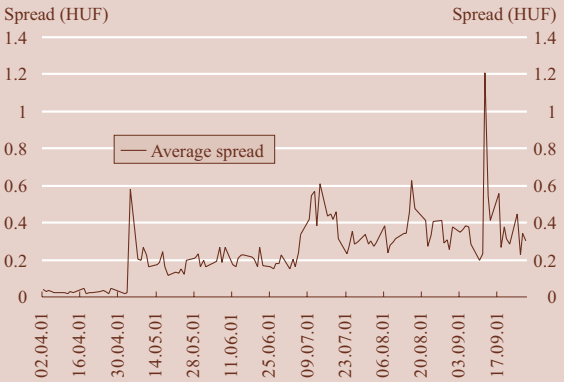
In a Central and East European comparison, international banks[6] net claims on Hungarian residents followed a stable course until the end of the first quarter of 2001 (see Chart 1.8). It is clear from the BIS data that bank claims on Poland jumped after the second half of 2000 (due primarily to higher fiscal financing requirement), while claims on the other three countries have remained virtually unchanged since 1999.

According to the September forecast by the IIF, the Institute of International Finance (a cooperation forum founded by banks and investment banks), net private capital inflows into all emerging countries will fall significantly in 2001, from USD 168 billion last year to USD 106 billion.[7] As far as Hungary is concerned, to date non-residents' government security transactions have not confirmed this prediction, as they rose quickly over the first six months of 2001. Even if non-residents' demand for government securities were to fall off over the remainder of the year, it is unlikely that this would lead to a financing problem, as any slowdown in the Hungarian economy would also result in a decline in the external financing requirement. Furthermore, it has been a clear trend of late that the resident corporate sector has been able to raise external funds easily whenever forint funds were in short supply.

Interest rate changes

Frequent and large-scale fluctuations in interest rates hinder credit risk assessment and financial planning. In addition to interest rate volatility tending to aggravate general uncertainty, unexpected interest rate increases pose the highest risk to financial stability, since in principle liabilities are repriced more quickly than assets. Nevertheless, in the Hungarian banking system, in-

***Chart 1.6* Average spread on the interbank market at the time of daily fixing** (01.04.2001–09.12.2001)



Source: NBH

***Chart 1.7* Non-residents' government security holdings**

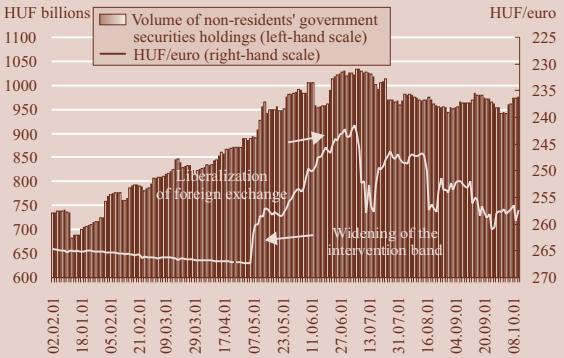
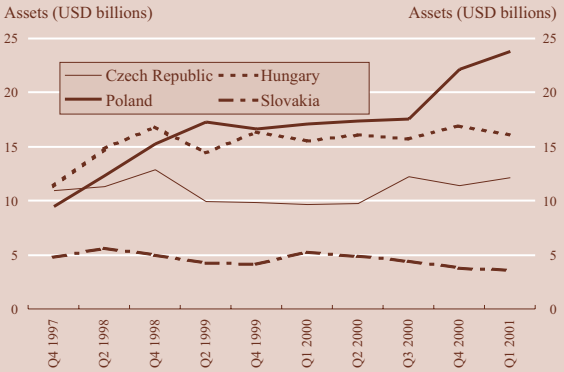


***Chart 1.8* International banks' claims on the residents of some Central European countries**

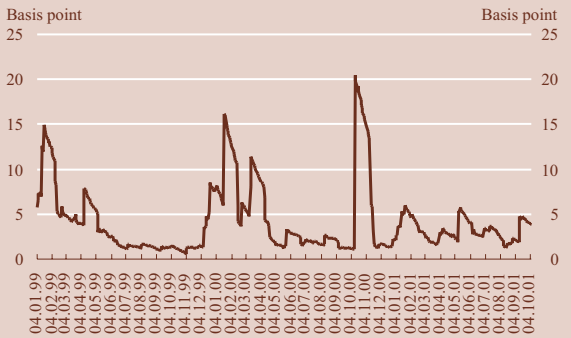


Source: BIS consolidated international banking statistics, July 2001, http://www.bis.org/statistics/consstats.htm.

[6] BIS reporting banks. Data exclude non-bank intermediaries (such as investment and pension funds) and export accounts receivable.

[7] IIF (Institute of International Finance): Capital Flows to Emerging Market Economies: September, 2001. http://www.iif.com/emr/index.quagga. See also IMF: Emerging Market Financing, August 08, 2001, http://www.imf.org/external/pubs/ft/emf/index.htm.

Chart 1.9 **Volatility of three-month benchmark yields**



terest rate increases do not result in any major loss of income, as Hungarian banks typically follow increases in liabilities-side rates with increases in asset-side rates only after a lag, and the assets side has a high proportion of floating-rate instruments.

An increase in real interest rates may also pose a risk to financial stability even if banks can pass on to borrowers the increase in the cost of funds by raising their lending rates. With a higher real interest rate, some investment projects are not profitable, and only companies with higher expected returns but also higher risk rating apply for loans. As far as on-going projects are concerned, an increase in real interest rates will increase the borrower's burden and reduce the net present value of the project, increasing the likelihood of bankruptcy. All in all, a major unexpected rise in real interest rates may worsen banks' credit portfolios and, consequently, profitability.

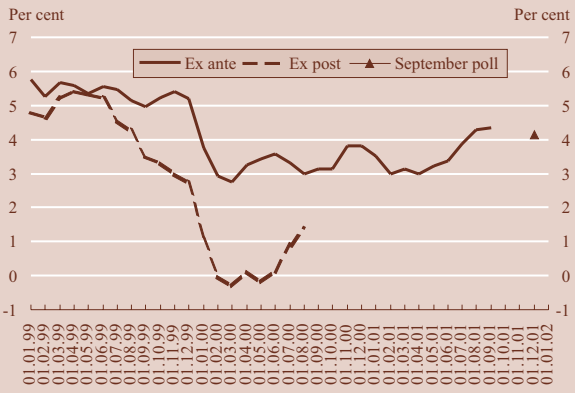
In the period between the time of the band widening, the launch of inflation targeting and early September, short-term interest rates were marked by low volatility in both historical and international comparison, despite the contagion affecting emerging markets. Clearly, the fluctuations in the risk premium were reflected more in the forint's exchange rate (see Chart 1.9). However, the uncertainty in the aftermath of the terrorist attack against the USA also had an impact on interest rates, in addition to the weakening of the exchange rate. On September 11th, the three-month benchmark yield rose by 20 basis points, despite a central bank rate cut on the previous day. However, a week later it returned to the original level.

The level of short-term yields underwent no major change despite the fact that band widening introduced major changes in the factors bearing on non-resident investors' demand for government securities. Presumably, there was an increase in the exchange rate risk premium, which, however, was offset by a decrease in expected depreciation.

The one-year ex ante real interest rate derived from market analysts' interest rate and inflation expectations has risen since the band widening, reflected in a higher decrease in inflation expectations than one-year interest rates. Although slightly higher than that seen over the past one and a half years, this 4–4.3 per cent rate can still be regarded as average by international standards. Accordingly, the rise poses no threat to stability. Market analysts' real interest rate expectation for the year-end is largely identical with the current rate (see Chart 1.10).

Changes in real interest rates differing from expectations may cause a shift in saving behaviour. Due to the unexpected rise in inflation beginning in August 2000, the twelve-month ex post real interest rate was exceptionally low, at around 0 per cent, between February and June, but it turned upward again in July. Lower-than-expected ex post real interest rates on bank deposits may have an adverse effect on financial savings, especially in the case of backward looking expectations.

Chart 1.10 **One-year ex ante and ex post real interest rates based on the Reuters inflation poll**



The equity market

The loss of confidence in investments with a higher risk rating has also had a bearing on the demand for shares quoted at the Budapest Stock Exchange (BSE). Just as in 2000 H2, investors have continued to avoid higher risk instruments, giving prefer-

ence to bonds rather than equities and to developed country securities rather than those offered by emerging countries. Thus, the weight of emerging-market equities in global investment fund portfolios has continued downward. This unfavourable trend gained further momentum when firms with shares traded in the stock market performed more poorly than expected, despite Hungary's sound economic fundamentals. As a combined result of the above effects, the price and turnover of shares fell equally in the course of 2001, relative to 2000. The region's other stock markets were also characterised by similar trends (see Chart 1.11, 1.12).

Nonetheless, domestic and international equity prices constitute a less important factor from the aspect of financial stability at the macroeconomic level than in the most advanced countries. The relative rate of stock exchange capitalisation is low and over 70 per cent of equities are held by non-residents. Consequently, the loss in the value of resident sectors' equity holdings is negligible, relative to these sectors' wealth and disposable income. Hungarian financial corporations have low equity exposures, and residents' foreign equity holdings are likewise small. Furthermore, the fall in equity prices does not pose any serious borrowing risk, as raising funds via equity issue has not been a typical means of borrowing as yet. Stock-market developments seem to exert the greatest influence on other financial enterprises (such as securities brokers), whose earnings are strongly dependent on the volume of securities trading. This is partly the reason for the consolidation process taking place in this segment.

Non-residents' high share in the ownership of exchange-traded assets may also pose some risk to stability, as a potential withdrawal of capital may, in principle, have an impact on the exchange rate of the forint. However, previous experience suggests that non-residents' sales tend to trigger a rapid fall in equity prices, due to resident investors' generally copying this behaviour. Therefore, changes in expectations primarily feed through to equity prices rather than serious affecting foreign exchange demand or the forint's exchange rate.

Chart 1.11 **Relative performance of the leading equity indices of the United States, Europe and Japan**
31 December 2000 = 100

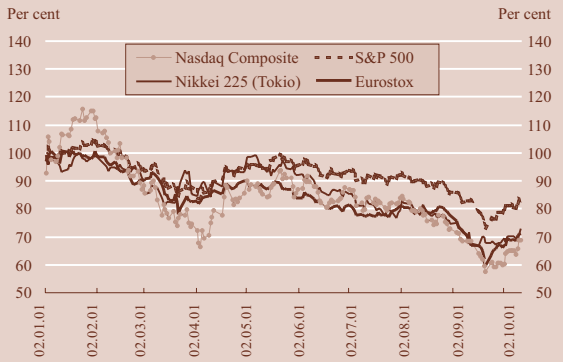
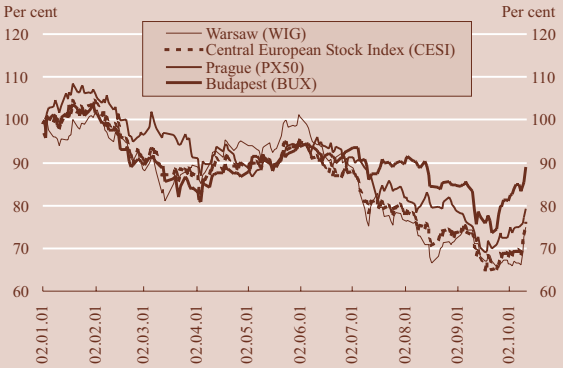


Chart 1.12 **Relative performance of stock-market indices in Central and Eastern Europe**
31 December 2000 = 100



Growth and inflation

GDP grew at a slower pace than last year and this decline can be mainly attributed to changes in cyclical conditions in Europe. Due to the adverse cyclical prospects, the volume of industrial investment has been virtually flat since the start of 2000. The relatively low second-quarter growth in international trade and a considerable slowdown in industrial output point to weaker external demand. Typically, export-oriented sectors have been most severely hit by the sluggish external activity, while consumer spending and public and household sector demand continue to expand at a rapid pace. Nor does the growth in retail trade indicate any drop off in domestic demand.

The stronger-than-expected slowdown in external activity foreshadows a further decline in GDP growth in 2001 H2. While fiscal expansion is expected to partially offset the negative effect of lower external demand on growth, firms' tighter wage policies may cause consumption growth to falter somewhat (see Table 1.C)

Table 1.C **Annual growth rate of real GDP and its components**
Percentage changes on a year earlier

Per cent

	2000					2001	
	Q1	Q2	Q3	Q4	Total	Q1	Q2
Households' consumer spending	3.7	3.8	3.7	4.0	3.8	5.4	4.8
Social benefits in kind	0.3	1.8	1.8	1.4	1.3	1.2	0.8
Personal consumption	3.0	3.4	3.4	3.5	3.3	4.5	4.0
Public consumption	1.0	1.1	2.0	2.0	1.6	1.2	2.1
Fixed investment	7.7	6.2	2.9	9.1	6.6	5.3	3.6
Gross investment*	14.5	4.2	9.5	11.9	9.9	4.8	2.9
Domestic use, total	5.7	3.4	5.0	6.0	5.0	4.3	3.5
Exports	20.9	21.0	19.9	25.0	21.8	17.6	13.6
Imports	18.5	16.4	20.8	27.3	21.1	16.8	12.7
GDP	6.5	5.6	4.5	4.2	5.2	4.4	4.0

* Figures include the errors and omissions, i.e. the difference between production- and use-side calculations.

In 2001 H1, the 10.4% increase in the consumer price index exceeded the average for the previous two years. The factors to blame for this negative development included inflation inertia in the wake of last year's temporary inflationary shocks, aggravated by another wave of unprocessed foodstuff price increases in the second quarter. After the flat rate of inflation seen over the past two years, the Bank launched a firmer disinflation policy, introducing the system of inflation targeting in June.

The National Bank's objective is to reduce inflation so that it meets the relevant Maastricht convergence criterion by the years 2004–2005. Since the launch of the regime, inflation has returned to the single-digit range, with the rate of price increases down to 7.6 per cent in September. This decrease was also due, to a considerable extent, to factors independent of monetary policy (for details on the effects of the new monetary policy framework, see Box 1.2 on Page 15).

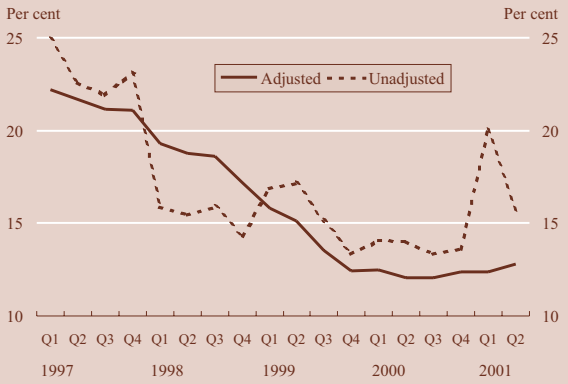
Setting an inflation target for the longer term facilitates forward-looking economic calculations. At the same time, the adoption of a new regime initially tends to increase uncertainty about the course of economic developments, which is clearly reflected in the variance of economic agents' inflation expectations.

The greatest risk to stability lies in the corporate sector's ability to adapt to the slowdown in revenue growth stemming from weaker external business activity, lower inflation and a higher-than-expected appreciation of the nominal exchange rate. Experiences gained in the economic decline in the wake of the 1998 Russian crisis suggest that the business sector will be able to respond quickly to a probable drop in its nominal income, by cutting back on investment and increasing wages at a slower pace.

Investment growth had already lost momentum before the rate of GDP growth began to slow down. As far as wage costs are concerned, the Bank expects adjustment to be much slower. The steady rate of inflation seen over the past two years caused the inertial components of inflation to become more pronounced, which is clearly reflected in high nominal wage growth seen at the start of the year. Although due to the distorting effect of the minimum wage increase (see issue 2/2001 of the Quarterly Report on Inflation), wage inflation figures can be assumed to be somewhat higher than effective growth in nominal wages, simultaneously with the expected average inflation of roughly 9 per cent for the year as a whole, wage costs in the business sector will increase in excess of 15 per cent (see Chart 1.13).

This year, enterprises' primary means of mitigating potential losses lies in payments provided on an irregular basis. Within the business sector wage structure, nearly one-fifth of earnings is comprised of non-regular pay, but the ratio of payments received on a regular and irregular basis may vary substantially across any given sector. Hence, the expectation for 2001 is that profitability in the business sector will decrease relative to the previous year. On the other hand, as weaker income growth prospects in 2002 will force companies to adopt a more cautious wage policy as early as at the start of the year, the Bank expects regular pay growth to moderate as well. At the same time, if inflation expectations take longer to adapt to the firm disinflation path announced by the central bank, prompting higher wage growth next year, then the profitability of the corporate sector may continue to deteriorate.

Chart 1.13* Wage inflation in the private sector
Same period of previous year = 100



* Twelve-month data recalculated using a statistical method on businesses employing more than 5 people; wage inflation data with the effect of both minimum wages and seasonal fluctuations eliminated.

Box 1.2 The new monetary policy framework and financial stability

Since May 2001, Hungarian monetary policy has undergone a number of major changes. The four key elements of these changes have been: 1) widening of the forint's exchange rate band; 2) the subsequent appreciation of the national currency; 3) full-scale foreign exchange liberalisation; and 4) the introduction of inflation targeting. In the following, the likely implications of each of these changes for capital flows and financial stability will be discussed.

Effect of the wider exchange rate band

The widening of the exchange rate band also implies greater variance in the exchange rate of the forint. Compared with the previous narrow-band regime, the short-term predictability of the exchange rate has decreased significantly, resulting in a decline in speculative capital inflows. As this reduces the most volatile component of capital flows, the change has had a favourable impact in terms of financial stability. There is now a smaller likelihood that following a long period of strong speculative capital inflows, a sudden reversal triggered by an external or internal shock could jeopardise the system of financial intermediation in Hungary.

Market participants have adapted to the likely increase in exchange rate volatility by altering the composition of their portfolios. This portfolio reallocation is reflected in the way Hungarian commercial banks have changed their total open foreign exchange positions (including derivatives accounts), winding up their short foreign exchange positions, which were typical prior to the band widening.

The higher risk associated with foreign exchange liabilities has also prompted some slow adjustment within the financing structure of non-financial corporations. In the wake of the band widening, companies' domestic forex borrowing remained flat (although, this trend had already started in the final quarter of 2000), leading to a drop in the share of internal foreign currency borrowing within total domestic borrowing. Although the corporate sector has increased its external borrowing in foreign currency, a much greater increase in assets has caused the external foreign currency position to improve.

Companies producting for the domestic market should reduce the proportion of their borrowing in foreign currency, since their earnings are in forint terms and thus they have no natural hedging. The other reason to do so is that they chose the cheaper, but higher risk foreign currency financing because of the interest rate difference. As far as exporting or importing companies are concerned, the reduced predictability of the exchange rate may entail higher fluctuations in their export earnings, and, ultimately, a decline in profitability. Therefore it is crucial that companies participating in international trade employ various exchange rate hedging instruments far more actively than they did over the past few years.

In addition to banks and the corporate sector, households have also adjusted their financial portfolios noticeably and, as a result, the proportion of foreign currency deposits, involving an increasing element of risk has decreased within their financial wealth.

Effect of the appreciation of the forint

Following the band widening, the forint appreciated substantially relative to the euro, which serves as the basket currency. This raises the question as to what extent the appreciation threatens corporate sector profitability, and consequently, the quality of banks' corporate credit portfolio, and whether this may cause an unsustainable deterioration in the current account.

Long-term nominal appreciation reduces exporters' profitability by putting upward pressure on the relative price of forint-denominated costs (above all, wage costs). However, thanks to the flexibility of the Hungarian labour market, it may well be assumed that the companies will not take long to adjust to the appreciation in the forint by modifying wage costs and the level of productivity. Hence, weaker profitability is expected to be a temporary problem only.

On the other hand, appreciation also had a significant one-off effect which was positive, by boosting financial earnings for the corporate sector as a whole. This was due to the fact that prior to the band widening, Hungarian companies had accumulated a sizeable amount of net foreign currency debt.

It should be noted that the appreciation of the forint in the aftermath of the band widening took place in the absence of any central bank intervention whatsoever. This implies that, prior to the band widening, the market felt that the forint was undervalued. The new, more appreciated exchange rate indicates that market participants have no fears even at this level of the exchange rate that the current account deficit will increase at an unsustainable rate.

The nominal appreciation of the forint is one of the key factors from the aspect of making a progress with disinflation. If the disinflation process is successful, the CPI-based real exchange rate will only appreciate temporarily. This transitory appreciation of the real exchange rate will cause the current account to deteriorate by one percentage point of GDP in 2002. Another effect which is expected to play a role will be the projected slowdown in external demand. The resulting deficit, however, will be well within the sustainable range, according to both the market and the central bank (the central bank's current account forecasts, can be found on page 20 of the August 2001 issue of the *Quarterly Report on Inflation*).

Effect of foreign exchange liberalisation

In respect of the full-scale convertibility of the forint, the following components may exert influence over financial stability: individuals' ability to open foreign currency accounts abroad, the liberalisation of non-residents' investments in financial instruments with less than one year to maturity at issue and the access of non-residents to derivative.

Recent experience shows that households' ability to open cross-border foreign currency accounts has not caused any outflow of foreign currency whatsoever, which is a sign of the Hungarian people's unbroken trust in domestic commercial banks, which are predominantly foreign owned anyway.

Even in the past, restrictions on non-residents' government security purchases were unable to prevent substantial short-term speculative capital inflows, as even then government bonds with a remaining term to maturity of less than one year were also available to non-residents. Following liberalisation, non-residents' demand was primarily concentrated on medium-term (three-to-four-year) government bonds rather than the newly available treasury bills and NBH-bonds, contrary to anticipations. Simultaneously with a sharp rise in non-residents' government security holdings, the portfolio's average remaining term to maturity also increased by nearly six months. This was partly due to the above-noted reduced predictability of the short-term exchange rate and partly to the government's commitment to join the monetary union as early as possible, in addition to the market's welcome of the disinflation programme to be conducted under an inflation targeting framework, which is intended to pave the way for membership.

Despite prior expectations, the liberalisation of foreign exchange forwards has not as yet induced a pickup in turnover in the foreign exchange futures market.

Effect of the inflation targeting framework

Upon introduction of the new system, the role of the rate of devaluation as a nominal anchor, responsible for guiding inflation, interest rate and exchange rate expectations, was taken over by the longer term inflation targets set by the central bank. One of the announced objectives of disinflation within the inflation targeting framework is to prepare Hungary for membership of the Economic and Monetary Union and the adoption of the euro by 2006–7.

When Hungarian economic policy makers expressed their commitment to the quickest possible adoption of the euro, market participants' uncertainty regarding the remaining lifetime of the national currency decreased, and the so-called "end point", i.e. the expected adoption date of the euro, also presumably shifted closer in time. At the same time, the existence and relative proximity of such an end point reduces the chance of a speculative attack on the forint during the run-up to the adoption of the euro, as investors' assessment of the sustainability of exchange-rate-dependent economic fundamentals (the current account deficit) is not over the infinite but rather a couple of years' horizon. Hence the stabilising effect of the "end point", brought closer and made more certain as the credibility of inflation targeting increases, is being reinforced. This does not rule out, however, that in the run-up to EMU membership the market will test the central bank and economic policy's willingness to bear the real costs in the interests of stability, as shown by the experiences associated with the ERM crisis of the early nineties.

Successful disinflation is likely to result in a fall in nominal interest rates and lower volatility in real interest rates, creating a less risky environment for both the corporate sector and the banking system. Nevertheless, the process may be interrupted by episodes of surprise disinflation, i.e. larger-than-expected decreases in inflation. These could, in principle, undermine corporate profitability because of the upsurge in the real cost of interest paid on corporate credits. However, as long-term fixed-rate forint loans account for a very small share of corporate sector liabilities, the risk to financial stability does not appear to be significant.

All in all, none of the components of the new monetary policy framework seems to have an adverse effect on financial stability. Although only a short time has passed since the adoption of the new system, the corporate and the banking sectors have been prudently adapting to the new circumstances.

Current account and the position vis-à-vis non-residents

International experience suggests that of the indicators of external equilibrium, financial stability seems to be most sensitive to the state of the current account, the terms of trade, the structure of capital flows, liabilities to non-residents and international reserves.

Domestic financial intermediation is affected by the current account deficit via foreign capital inflows and/or a fall in international reserves. While the deficit is judged in relation to the level and structure of whole economy investment, financial stability is

affected by the state of the terms of trade and the method of financing the deficit (the nature and maturity of capital inflows). The recent course of the current account deficit was favourable, falling from 4.8 per cent in 1998 to 3.2 per cent in 2000, as a proportion of GDP.

Over the next one and a half years, the external financing requirement is not expected to increase as a proportion of GDP: on the contrary, it is expected to decrease markedly in the course of 2001, together with the deficit on the current account (see Table 1.D), due primarily to heavy cuts in corporate sector investment expenditure. At the same time, the drop in corporate sector investment growth seems larger than justified by the major decrease in disposable income caused by tighter external demand. While this is reassuring from the point of view of stability, it is an unwelcome phenomenon in terms of its effect on long-term economic growth).

Terms of trade are expected to improve slightly over the coming period. The primary risk to small, open economies with a high concentration of exports, lies in a strong deterioration in the terms of trade. This is because the narrowing of firms' liquidity may weaken the quality of the banking system's credit portfolio.[8] A greater problem may be posed by the real appreciation of the forint (see Chart 1.14), which may exert downward pressure on net export growth, as a result of a more persistent slowdown in external activity than expected.

Foreign direct investment (FDI) can be viewed as the most stable component of financing. The recent upsurge in Hungarian capital exports has exerted downward pressure on the level of net direct investments as a percentage of GDP, introducing an element of uncertainty into their development. Nevertheless, Hungary's higher capital exports should by no means be viewed as a cause for concern from the aspect of stability, as the factors at work predominantly include strategic expansion and regional acquisitions by a few large Hungarian companies. At the same time, gross FDI may quite likely decline over the longer term. Nor is this a cause for concern, as it is a natural consequence of new financing forms (such as cross-border and domestic bank credits) gradually replacing FDI, as the country's financial intermediation system comes of age. Nevertheless, net FDI will remain one of the basic components of financing over the near term. Non-residents' government security purchases also constitute a stable source of portfolio capital inflow. Added to the FDI inflows, they have provided financing in excess of the current account deficit in recent years, and are expected to do so in 2001 and approximately in 2002 as well. Other items of financing are higher in volatility, typically resulting in net outflows prior to 1998 and net inflows after 1998. In 2001 and 2002, this channel is again expected to show net outflows on balance, due largely to a decrease in the private sector external financing requirement, and to a lesser extent, the fact that the consolidated general government's foreign exchange credits are being less and less frequently renewed in foreign currency terms. In terms of risk, the maturity structure of such items appears to be favourable, as at the higher risk shorter maturities the economy as a whole is more of a lender to non-residents.

[8]At the same time, excessive improvement in the terms of trade may also increase the vulnerability of the financial system, if it leads to the emergence of bubbles in domestic capital markets.

Table 1.D **Current account and financing the deficit as a percentage of GDP**

Per cent

	1996	1997	1998	1999	2000	2001*	2002*
Current account deficit	3.7	2.1	4.8	4.3	3.3	1.6–2.6	1.8–2.8
Financing	0.5	1.8	6.6	9.3	5.6	3.0–3.5	0.1–1.3
– direct investment	5.0	3.8	3.3	3.6	2.5	2.9–3.1	2.3–2.7
– non-residents' government security purchases	0.2	0.3	1.9	1.3	2.3	1.6–1.8	0.8–1.2
– other	–4.8	–2.3	1.4	4.3	0.9	-1.4–(-1.2)	-3.0-(-2.5)
Change in reserves	–3.2	–0.3	1.8	5.0	2.3	0.9–1.4	-2.1–(-1.4)

* NBH projections (See *Quarterly Report on Inflation*, August 2001.)

Chart 1.14 **Terms of trade and the real exchange rate**

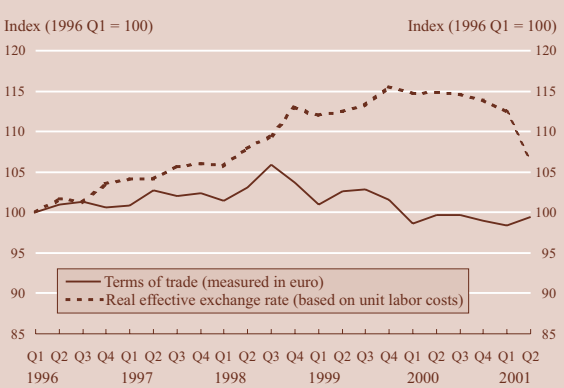
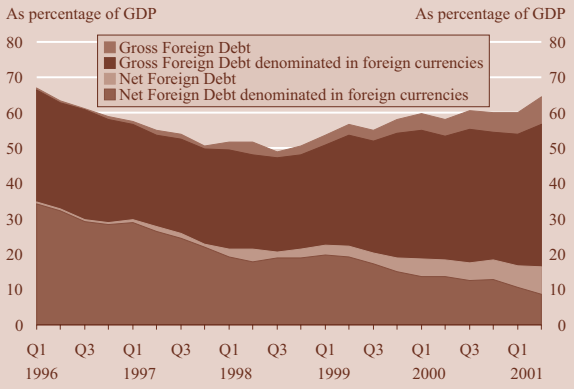


Chart 1.15* Gross and net foreign debt



* End-of-quarter volumes as a percentage of the GDP for the preceding four quarters.

***Chart 1.16* Proportion of short-term foreign debt**

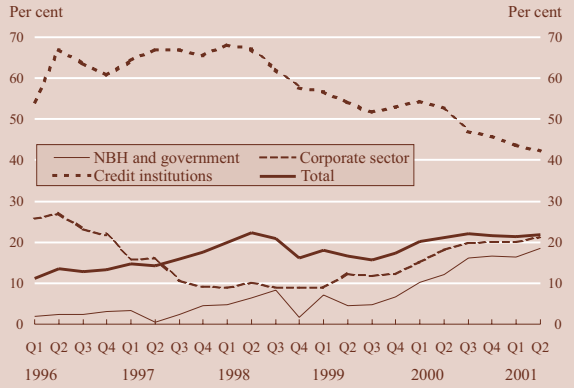


***Chart 1.17* Changes in foreign exchange reserves**

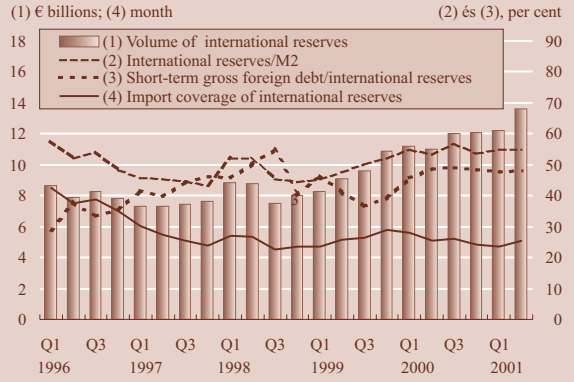
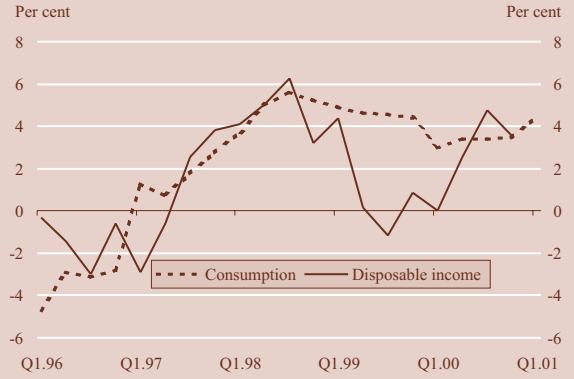


***Chart 1.18* Real growth in consumption and disposable income**

Percentage changes on a year earlier



The increase in the share of forint-denominated government securities within foreign debt (12 per cent at end-June 2001) was a welcome development in respect of exchange rate risk, but due to the shorter maturity of such securities, they carry greater renewal risk. When the speculative motif vanished in the wake of the band widening, non-residents' demand for such securities dried up and the average term to maturity of such securities lengthened (see Chart 1.15).

The weight of short-term debt instruments rose slightly within gross debt, but at 22 per cent it is still viewed as low in an international comparison. Although the majority of short-term debt is owed by credit institutions, more recently the increase in debt has been concentrated in the National Bank and the corporate sector, simultaneously with a fall in short-term debt instruments within credit institutions' foreign debt.[9] The relevant risk exposure does not appear to be high, especially in view of the fact that in net terms the private sector is a creditor vis-à-vis non-residents at the short maturities (see Chart 1.16).

Ever since the exchange rate band was widened, the amount of foreign exchange reserves has been of smaller significance, as most of the tension developing as a result of major capital movements is absorbed by exchange rate changes. With the level of foreign exchange reserves standing at EUR 13.6 billion in June 2001, short-term gross national debt has consistently remained below 50 per cent of the level of foreign exchange reserves, and the ratio of foreign exchange reserves to the M2 monetary aggregate is also stable (see Chart 1.17). In view of these indicators the level of the Hungarian foreign exchange reserves appears to be more than safe by international standards, and due to the fact that the foreign exchange loans of general government are being renewed in forint terms, the reserves are expected to decrease.

The non-financial sector

Households

Income position

In 2001 Q1, households continued to increase their consumption vigorously (see Chart 1.18), which, as a proportion of income, has been high since 1999 primarily by cutting back on financial savings (see Chart 1.19). Households smooth their consumption by either reducing or increasing the stock of financial assets, as needs be. The key role of consumer credits within household borrowing indicates that rising indebtedness is primarily motivated by the desire to achieve a permanently higher level of consumption. At the same time, the faster growth in residential construction and purchase loans is reflected in the slow but clear rise in investment expenditures.

In 1999, the savings ratio fell from the previous average of 6 per cent to 4 per cent in relation to disposable income. This was partly due to the significant dampening effect of external inflationary shocks (oil and food prices) on household-sector income, which forced a divergence between the paths of income

[9] This was also due to changes in the reserve requirement on cross-border liabilities (in July 2000 and July 2001).

and consumption growth which had been in synch until then. In addition to these temporary shocks, the two growth rates also diverged due to a longer-term phenomenon, namely higher institutional flexibility of credit supply easing the liquidity constraint.

International comparison (see Chart 1.20) also suggests that a lower propensity to save does not result in considerable risk within the household sector. In Hungary, households' gross financial wealth is low relative to total income, with the level of indebtedness also falling behind that of developed countries.

Households' financial balance

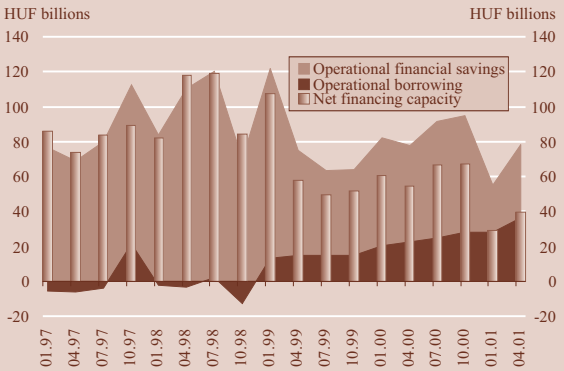
On the assets side of the balance, the widening of the forint's exchange rate band has exerted upward pressure on the exchange rate risk relating to financial assets which are not denominated in forints. Foreign currency deposits carry weight within Hungarian households' financial wealth which is not without significance. The proportion of such fell from 17–18 per cent in 1995 to below 11 per cent in 2001, which implies that a 1 per cent change in the forint exchange rate will cause a 0.1 per cent shift in the value of total wealth.

Changes in the ratio of foreign currency to forint deposits indicate, above all, whether households consider the inflation risk or the exchange rate risk to be higher. Under the former narrow-band crawling peg system they did not see exchange rate risk as being high. At that time, households' deposit decisions were primarily guided by expectations and uncertainty about inflation prospects. Over the six years since 1995, they have made upward or downward shifts in the relative weight of their forint and foreign currency deposits in their portfolio in accordance with changes in domestic inflation, but after a small lag (see Chart 1.21).

However, the withdrawal of foreign currency deposits[10] in June 2001 was triggered by households' expectation of a strengthening of the forint and an increase in the exchange rate risk now that the fluctuation band has been widened. Accordingly, foreign currency assets represent higher risk. Nevertheless, the subdued rate of the decrease suggests that inflation uncertainty has remained virtually unchanged, and that savings in dollars involved higher exchange rate risk, even in the past.[11]

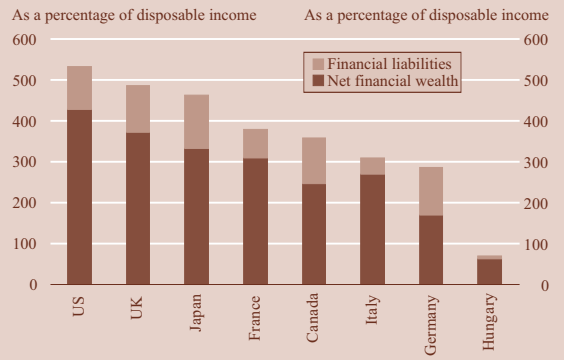
The drop in foreign currency deposits in June gave further impetus to a trend typical of the past few years with households reducing high market risk instruments in their portfolios, which implies that the higher weight of non-bank financial savings does not entail higher risk (see Chart 1.22 and Table 1.E on Page 20). A substantial portion of financial savings over the first seven months of 2001 flowed into life assurance and pension pre-saving schemes, which can be regarded as structural components, i.e. they are not sensitive to short-term interest rate

***Chart 1.19* Operational net financing capacity**



Note. unchanged, at consumer price level of January 1997.

***Chart 1.20* Households' financial liabilities and net financial wealth in certain countries**



Source. OECD: Economic Outlook. 2001/1
* Figures for the OECD countries are from 1999 and those for Hungary from 2000.

***Chart 1.21* Foreign currency deposits as a percentage of forint deposits**

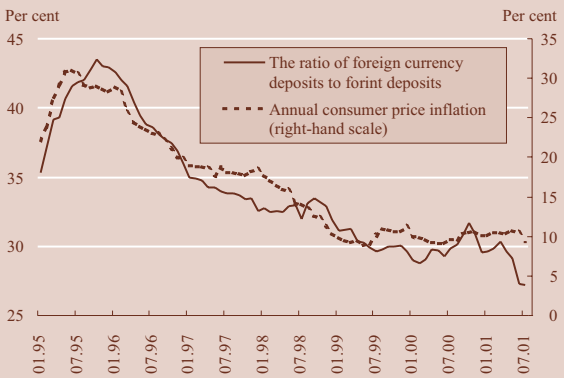
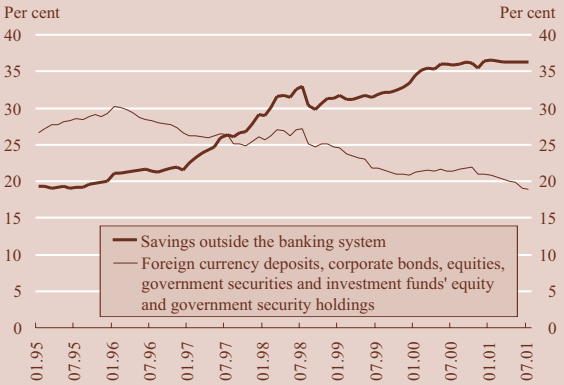


***Chart 1.22* Weight of non-bank instruments and instruments with exposure to market risk within total financial wealth**



[10] The change in foreign currency deposits shown in Chart 1.21 reflects the strengthening of the forint to a great extent, but figures from which the effect of exchange rate change and seasonality has been eliminated are also outstanding relative to previous years.

[11] Since 1 January 2000, the foreign currency basket used to designate the exchange rate band has only contained the euro, and even previously, one single European currency held a weight of 70 per cent. Consequently, the exchange rate system was only able to limit volatility against the dollar to a lesser extent.

changes. Simultaneously, government security and investment units holdings rose slightly, together with a drop in the share of equities within household financial wealth.

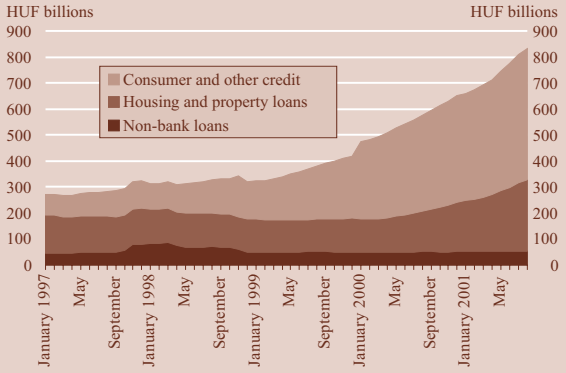
As far as household financial liabilities are concerned, the level of indebtedness has continued to rise during 2001, but for some time there has been a shift in the ratio of the contribution of the two main credit types to total borrowing growth. While until end-2000 consumer credit grew at a considerably faster pace than housing loans, early 2000 saw the beginning of steady acceleration in the latter, and in July 2001 annual growth in housing loans exceeded 70 per cent, compared with 30–40 per cent annual growth in consumer credit in 2001 (see Chart 1.23).

Table 1.E **Composition of household financial wealth**

%

	January 1997	January 2001	August 2001
Notes and coin	13.8	11.4	12.2
Forint deposit	45.3	38.3	39.0
Unpaid earnings	2.0	2.1	1.8
Credit institution securities	0.9	0.4	0.4
Foreign currency deposits	15.6	11.3	10.5
Mutual funds	3.4	7.2	7.3
Government securities	9.6	12.7	12.6
Equities	4.2	4.0	2.4
Corporate bonds	0.6	0.1	0.1
Life insurance premium	3.7	6.3	6.5
Pension funds assets	0.8	6.2	7.2

Chart 1.23 **Household debt**



Note: While our previous issues reported on lending to small businesses as a separate category, from now on only borrowing by sole proprietors is included with the household lending category.

Sector of non-financial corporations

The exposure of the system of financial intermediation to the non-financial corporate sector, the main borrower in the Hungarian and developed economies, exerts great influence over financial stability.

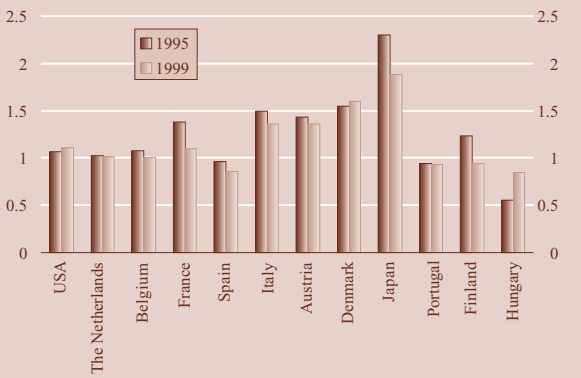
In addition to capital structure and debt characteristics, non-financial corporations' risk to stability is also significantly affected by fluctuations in corporate income, i.e. the cyclical position. In this report, in addition to macroeconomic indicators, corporate-level data are also shown in order to facilitate an intercompany analysis of risk factors. Analysis of the distribution of risk factors is an important device, as any increase in standard deviation signals a rise in classified loans, even when the aggregate indicators are unchanged. Data on the situation of the non-financial corporate sector are available by an aggregate and industry breakdown for 2000. However, data by company breakdown, based on corporate tax returns, are only available until 1999.

Leverage and the balance sheet structure

Even though Hungarian corporate sector debt has been rising rapidly over the past five years, it does not appear to be high in an international comparison. As a result of the upward trend, the previously quite low corporate gearing ratio is approximating the level typical of more advanced economies (see Chart 1.24). The growing significance of external financing can be partly attributed to the fact that the stabilisation of macroeconomic conditions and the concomitant reduction in risks has enabled operating companies to employ greater degree of gearing. Another contributory factor to the increase in gearing has been resident firms' regional acquisitions typically by means of taking out bank or intercompany loans or, less frequently, through bond issues, rather than by new equity issues. These factors suggest that external funds are expected to continue to increase in weight within financing in the future even if at a more moderate rate than during the period from 1995 to 1999.

This trend is seemingly contradicted by the decrease seen in 2000 in the proportion of liabilities within the balance sheet total, in contrast to its development between 1995 and 1999. Nevertheless, indicators offering a better assessment of non-financial corporations' level of debt vis-à-vis financial intermediaries continue to reflect an upward trend in gearing, even though at a clearly slower pace than over the previous few years (see Chart

Chart 1.24 **Total debt to equity ratio, excluding trade credit**



Source: European Commission. DG ECFIN. BACH databases,calculations by the NBH using the State Tax and Financial Control Authority (APEH) databasese

1.26). Liabilities excluding trade credit have increased slightly, while long-term liabilities have increased to a greater extent, relative to equity.

This moderate corporate sector indebtedness is conducive to the stability of the financial system. However, loans are distributed in a way that points to the presence of financial risks. First, the intra-sectoral distribution of borrowing reflects a high degree of concentration, with nearly 50 per cent of companies not having borrowed at all, and merely 27 per cent of companies having long-term liabilities. Second, a large portion of total borrowing goes to financing loss-making firms, with 30 per cent of total long-term liabilities and 45 per cent of total short-term borrowing by the entire non-financial corporate sector involving companies with either negative operating cash-flows or a very high interest charges to cash-flow ratio (financial loss[12]). Third, a significant part of total corporate debt is comprised of liabilities to non-residents (see Chart 1.26). However, it is primarily companies with better indicators and non-resident involvement that typically have access to foreign funds. Thus, resident banks presumably have a worse customer base than non-resident banks.

Along with the rising predictability of the macroeconomic environment, there has been a steady increase within corporate liabilities of loans for terms in excess of one year. This tends to reduce corporate sector exposure to liquidity shocks and enhance the flexibility of corporate liabilities management. Nevertheless, the aggregate data conceal major structural differences at the microeconomic level. It is primarily large companies that have access to longer term loans, while as much as 75 per cent of enterprises continue to have access only to short-term business loans if any. This implies that the credit rating of small and medium-sized companies is such that it only provides them with access to shorter term loans covered by current assets.

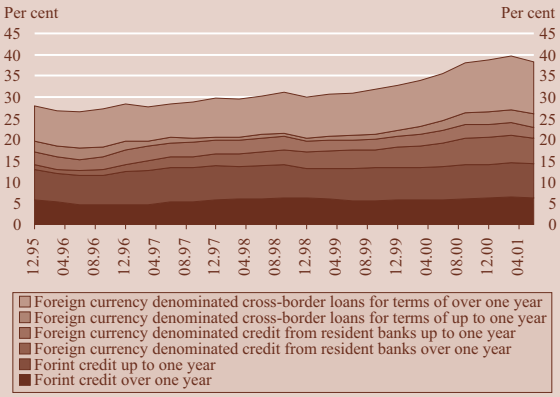
Over 60 per cent of non-financial corporations' gross debt and 70 per cent of net debt is denominated in foreign currency. A significant part of these loans is associated with companies engaged in international trade. These companies have a naturally hedged positions in respect of their foreign currency debt, as they can use their foreign currency earnings to mitigate exchange rate risk.

Nevertheless, a few of these companies also incur some risk due to the denomination structure of foreign currency loans. This is because dollar-based loans account for nearly 33 per cent of firms' debt to the domestic banking system, while the structure of foreign trade would justify a much smaller share.

Some companies with operations in sectors not participating in international trade and therefore without exposure to import competition have also accumulated a substantial amount of domestic foreign currency loans. This is due to the fact that under the former narrow-band exchange rate regime interest rates on foreign currency loans were lower than those on forint loans, making them cheaper than forint financing while posing only a small risk. However, when the exchange rate band of the forint

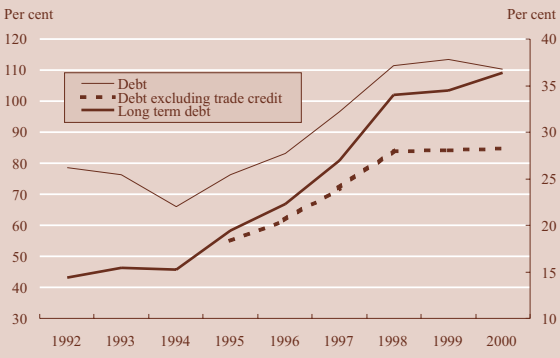
[12] In the assessment of interest cover, we have used the value of financial earnings instead of net interest charges, since due to the high weight of the sector's foreign currency borrowing, borrowing costs appear, to a great extent, in the form of exchange rate loss.

Chart 1.25 **Credit structure of non-financial corporations as a percentage of GDP***



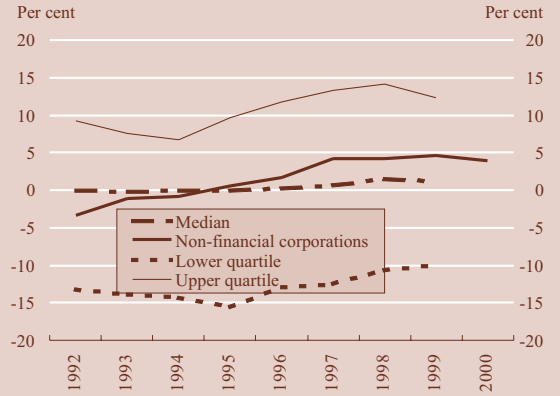
* External foreign currency lending includes trade credit from non-residents, but excludes intercompany loans.

Chart 1.26 **Debt to equity ratios**



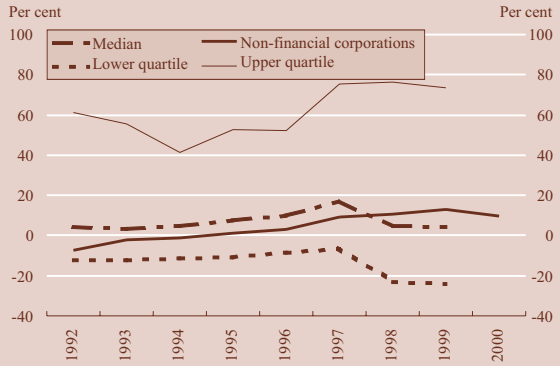
Source: Calculations by the NBH using the State Tax and Financial Control Authority (APEH) database

***Chart 1.27* Return (after-tax profit adjusted for extraordinary items) on assets**



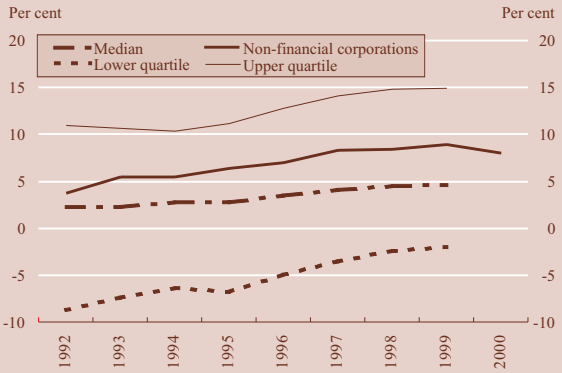
Source: NBH calculations using the APEH's database.

***Chart 1.28* Return (after-tax profit adjusted for extraordinary items) on equity**



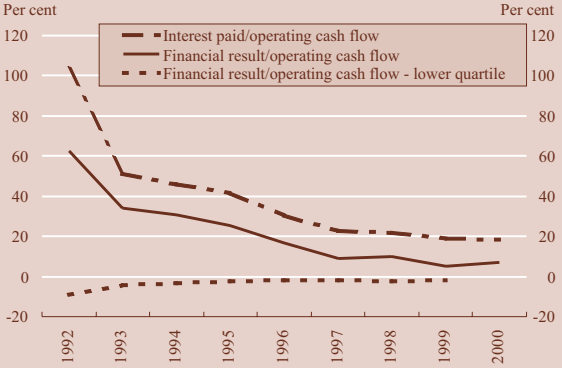
Source: NBH calculation using the APEH's database.

***Chart 1.29* Non-financial corporations' profit margin**



Source: NBH calculation using the APEH's database.

Chart 1.30* Non-financial corporations' debt burden to operating cash flow



Source: NBH calculation using the APEH's database.
* Comprised of depreciation and operating profit or loss.

was widened, there was an upsurge in the exchange rate exposure of companies borrowing in foreign currency but having no natural hedging for their positions, while they were able to make considerable profits thanks to the appreciation of the Hungarian currency. At the same time, these foreign currency loans pose an indirect exchange rate risk in the form of credit risk for the banking system. It was probably due to the recognition of this exchange rate risk that in the wake of the band widening a number of sectors lacking natural hedging began to whittle away at the proportion of domestic foreign currency loans within their financing (by not renewing their foreign currency loans).

Profitability, liquidity and interest cover

The corporate sector's income and cash-flow creating ability improved steadily until 1999, but then suffered a reversal in 2000, as is reflected by certain indicators. This can be attributed to a deterioration in the terms of trade, triggered by a rise in energy and oil prices. In addition, another effect surfaced late last year when economic growth began to slow in the European Union, and in Germany in particular. This is already reflected in export and industrial production growth figures, signalling a slight downturn in 2000 Q4 and a more pronounced one from 2001.

While the various profitability indices improved together with the cash-flow creating ability until 1999, the year 2000 witnessed a slight worsening in each profitability index (return on equity (ROE), return on assets (ROA) and the profit margin). The standard deviation of the ROA ratio across the corporate sector has narrowed over the past few years. By contrast, intercompany differences seem to have increased in terms of the ROE ratio, which implies that the indebtedness of the most loss making and most profitable enterprises increased at an above-average rate (see Charts 1.27, 1.28 and 1.29).

Despite the rising capital gearing, the financial costs to cash flow ratio of companies decreased at a fast pace until 1999, thanks to a rapid improvement in corporate profitability. However, 2000 saw a slight increase in the ratio, due to worsening profitability and a higher stock of credit (see Chart 1.30).

Box 1.3 The commercial real property business

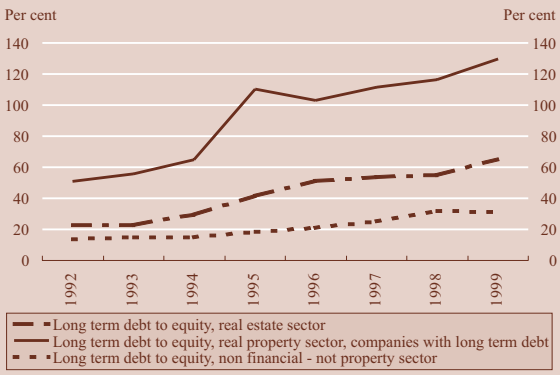
The state of the real property sector is of key importance in assessing the financial system's exposure to risk. The property sector accounts for nearly 6 per cent of Hungarian companies' total on-balance-sheet liabilities and 15.5 per cent of their long-term liabilities, 5.8 per cent of the Hungarian financial system's claims on companies and 8.5 per cent of long-term loans. Moreover, the property sector has the highest debt ratios within the corporate sector. Due to the long recovery period of property investments, the bulk of such liabilities is comprised of loans with terms in excess of one year or even five years. As these loans are secured by the property, a rise in property prices may push up the sector's level of debt. International experience suggests that due to significant, pro-cyclical fluctuations in property prices and the sector's high stock of borrowing from banks, real property enterprises pose a significant risk to stability. However, this risk is mitigated by the fact that a large portion of property developers borrow from non-resident banks.

The property sector can be divided into two sections. One is engaged in property renting, trading and brokering and is typically loss-making, according to balance-sheet statements. As the other group with operations involving long-term loans is of more significance with regard to financial stability, they are the focus of our analysis. Due to such companies' substantial volume of debt, they incur much higher interest charges than other areas of the corporate sector.

Eighty-seven per cent of resident banks' lending for the purpose of property development is denominated in foreign currency, including 80 per cent for terms in excess of one year. These loans pose a default risk for financial intermediaries, as office space rents are set in DM terms (in order to eliminate exchange rate risk), but companies occupying the leased premises receive their earnings in forint terms. Hence, debt servicing and interest charges involved in a foreign currency credit may considerably increase default risk if there is a weakening in the forint's exchange rate. The widening of the exchange rate band has significantly increased indirect exchange rate risk, in the form of credit risk (see Chart 1.31., 1.32).

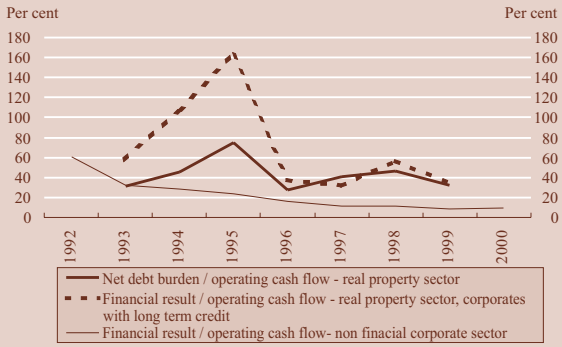
Over the past two years, demand in the Budapest office space market has not kept pace with the rapidly increasing supply. Hence, the proportion of unutilised office area has risen from the earlier level of 10–15 per cent to the current rate of 22 per cent. This ample supply is also reflected in changes in rental prices (see Chart 1.33).

Chart 1.31 **Long-term debt to equity**



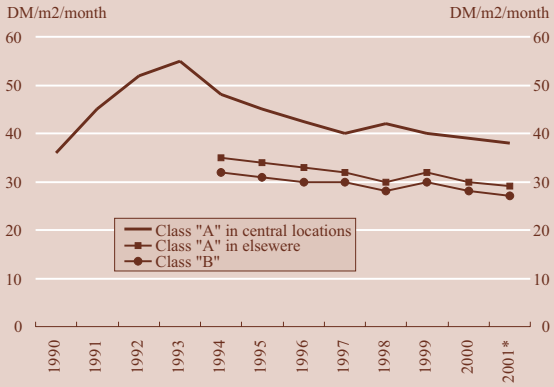
Source: NBH calculation using the APEH's database.

Chart 1.32 **Debt burden ratios, financial results and net interest charges as a proportion of operating cash flow**



Source: NBH calculation using the APEH's database.

Chart 1.33 **Budapest office rent levels in DM**



Source: DTZ Hungary.

II. The stability of the banking sector

Chart 2.1 **Changes in qualified assets and profitability**

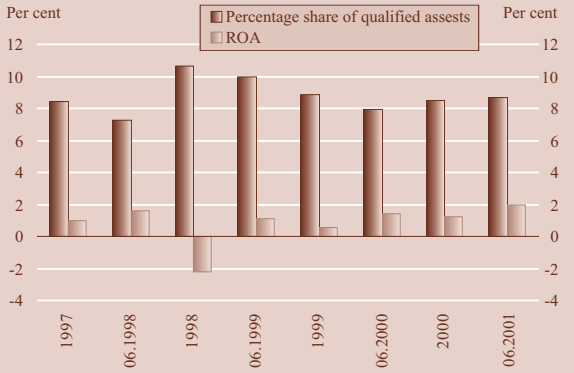
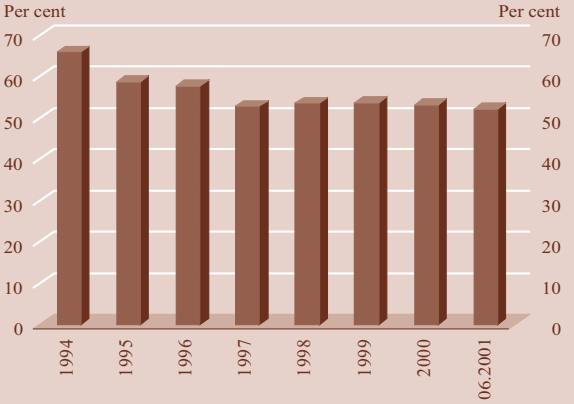


Chart 2.2 **Percentage shares of the five largest banks within banking sector assets**



The positive developments underlying Hungarian banks' performance in 2000 continued in 2001 H1. The sector's balance sheet total increased by 5.7 per cent to HUF 8,905 billion in the period under review, with credit expansion continuing without interruption. Profitability and cost efficiency indicators also showed further improvements. Owing to the strong growth in lending to clients and a modest increase in banking spreads, banks registered a considerable increase in net interest income.

Although the lending expansion, which has lasted for nearly two years now, has resulted in the banking sector's liquidity tightening further, the sector's overall portfolio quality did not deteriorate in the first half. Nevertheless, should robust lending activity continue, this may threaten to undermine portfolio quality, especially if cyclical conditions take an unfavourable turn (See Chart 2.1). The overall interest rate risks to which Hungarian banks are exposed have continued to abate and, by cutting back their open foreign exchange positions, they have managed to buffer the negative impacts of increased exchange rate volatility caused by the monetary authorities' move to widen the forint's intervention band in May.

Banks' regulatory capital grew proportionately with the increase in their additional risks, precipitated by the pick-up in lending to clients in the period under review. Their capital strength is judged as adequate and, owing to the presence of high-quality professional foreign owners, banks' chances to obtain additional capital injections are also secured (see Chart 2.1).

Based on the picture provided by the Herfindhal index, a gauge of business concentration calculated from balance sheet totals, the Hungarian banking sector's concentration is still not seen as high. Reductions in the degree of concentration and the decline in market shares accounted for by the largest five domestic banks have been characteristic of the last several years. However, these will likely cease temporarily in the future due to the mergers completed and those currently underway (see Chart 2.2).

In 2001, several highly important changes occurred to banking sector regulation and data reporting rules, as follows:

– Accounting rules applying to banks were altered early in the year, whereby the earlier rule of recording balance sheet assets at gross value was replaced by recording on a net value basis. Simultaneously with this, a switch from the system of provisions built for gross assets to cover expected lending losses to a new regime of value loss accounting took place.
– The new legislation on the trading book entered into force in January 2001. Since April, Hungarian banks' are required to record positions in the trading book and to observe the new rules on setting capital requirements for market risks, in harmony with the Capital Adequacy Directive of the European Union. Simultaneously with this, the system of

recording and weighting forward items remaining in the banking book was completely overhauled and placed on a common platform with European Union practices.[1] Based on the minimum statutory limit, included in the rules relating to the trading book, currently around half of the domestic banks keep trading books (19 out of the total 38). These banks account for a combined total of 82.9 per cent of the Hungarian banking market.

– As part of the regulation on capital requirements relating to market risks, banks will be required in the future to provide adequate capital for exchange rate risks undertaken in their trading books and banking books, and thus provisions built earlier for exchange rate risks and to provide protection against exchange rate losses will be released.
– The rules relating to country risk exposures have been changed. The earlier requirement of provisioning against country risk exposure has been replaced by capital requirements relating to country risks. Simultaneously, banks have been allowed to release provisions generated against country risk exposures.
– The rules for the treatment of regulatory capital and capital adequacy have also been revamped. In addition to the trading book treatment of capital requirement and the risk weighting of forward items, noted earlier, the outstanding total of general risk provisions, reduced by the potential tax content, has been adopted as a constituent of the core capital elements (earlier, this was not included in capital). From now on, OFI investments, earlier deductible from core capital elements, are to be subtracted from the sum of core and additional capital elements.
– The reflection in reporting obligations of the new regulations was the most important factor explaining the changes in data reporting by banks and thus the data available for the purposes of analysis. In addition, the sector classification of the Hungarian economy has also been changed.[2] Sole proprietors have been regrouped from the corporate sector into the household sector. From among the non-profit organisations which have in the past been treated separately, only non-profit institutions serving households are now treated as separate entities, those relating to the corporate sector are not separable within the corporate sector.

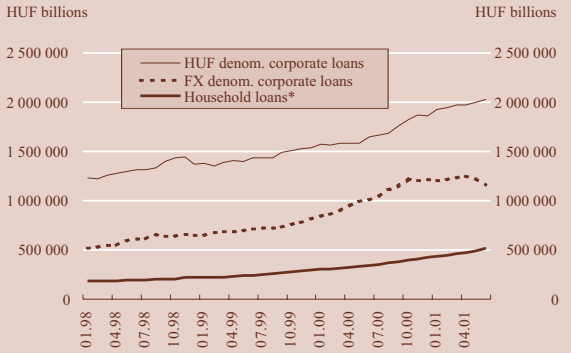
The effects of the above changes will be dealt with more detail in the sub-sections of this Report.

Credit risks

Hungarian banks' outstanding loans[3] rose by 5.5 per cent in nominal terms in 2001 H1. This was not nearly one half of the increase recorded in the comparable period of the previous year, and also fell short of the increase in the same period two years earlier. The apparent break in the upward trend of outstanding lending, however, is somewhat deceptive – on the heels of the move to widen the intervention band in early May, the ap-

[1] For the differences, existing before the changes were implemented, see the Box in the August 2000 issue of the Report on Financial Stability.
[2] From June 2001, the Bank has switched to using the sector classification according the System of National Accounts. Therefore, from May 2001 the balance sheet reports, requested by the supervisory authority and the Bank on a monthly basis, also include the new sector classification.
[3] Outstanding loans include lending to the central government and other sector, the corporate sector and individuals.

Chart 2.3 **Forint equivalent of outstanding forint and foreign currency loans to households and businesses**



* Excluding sole proprietors.

Chart 2.4 **Combined share of loans to businesses and households within the balance sheet total**

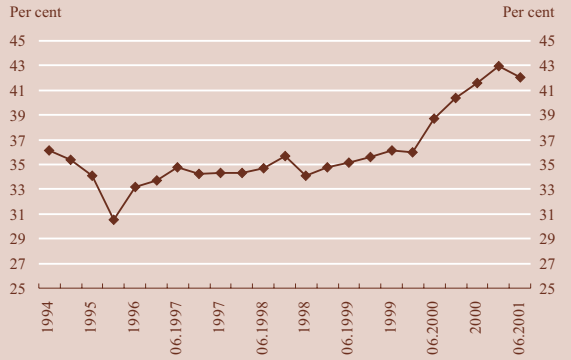


Chart 2.5 **Lombard loans**

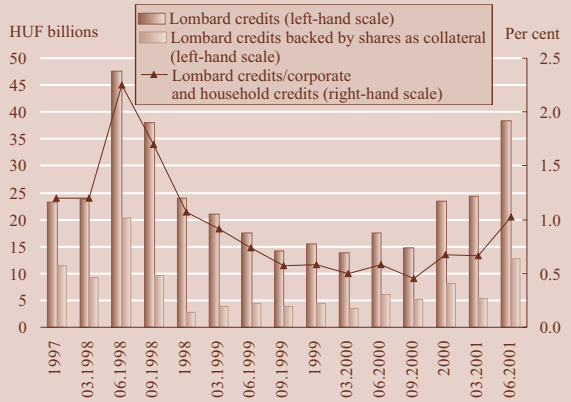
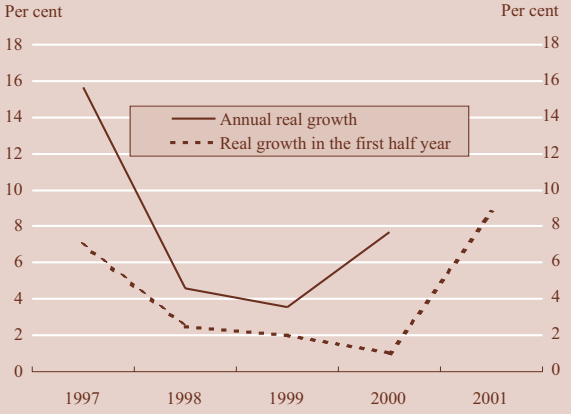


Chart 2.6 **Real growth rates of corporate sector forint loans**



preciation of the forint exchange rate led to the forint equivalent of foreign currency assets falling significantly. Up 20.6 per cent in nominal terms, outstanding loans to households[4] continued to rise robustly in 2001 H1. Domestic currency loans outstanding to the corporate sector,[5] accounting for the majority of total loans (some 60–64 per cent), rose even more robustly than last year. By contrast, after eliminating the exchange rate effect, i.e. variations in the forint exchange rate and cross exchange rate movements, the value of foreign currency loans, accounting for the smaller portion of the total, remained static (see Chart 2.3). That meant the upward trend of lending to this sector remained unbroken despite its forint value rising by a mere 3.6 per cent in the first half of the year (even falling in June in nominal terms). The combined total of loans to households and the corporate sector as a share of the balance sheet total shrank nearly to end-2000 levels towards the end of 2001 H1, after standing around 43 per cent throughout the period (see Chart 2.4).

The 7.4 per cent increase in risk-weighted balance sheet assets exceeded the growth of the balance sheet total in 2001 H1, although to a lower extent than in the same period in 2000. However, the increase in credit risk, outpacing the rises in both outstanding loans and the balance sheet total, indicates a continued shift, although at a more subdued pace, towards clients carrying higher risks in 2001 H1. As a result, the proportion of claims against the risk-free central bank within total assets fell by 3 percentage points in the period.

Despite the increase in June 2001, the volume of lending against securities as collateral[6] and its share as a percentage of loans to clients remain low, so the risk arising from a potential price bubble in the securities market is seen as insignificant (see Chart 2.5).

Corporate lending

Banks maintained the dynamic of lending to the corporate sector in the first half. In contrast with 2000, when growth in lending affected both forint and foreign currency loans, there was a shift towards forint loans in 2001 H1. Whereas nominal and real growth rates for forint loans both grew (see Chart 2.6),[7] after eliminating variations in the forint exchange rate and cross exchange rate movements, the outstanding amount of foreign currency loans remained virtually flat. A partial explanation for this may have been the move to widen the intervention band in early May and the expectations of such a policy move. First, increased exchange rate volatility poses more risks for businesses, if they borrow in foreign currency without having the required cover. Second, the chances

[4] As time series relating to the household sector according to the new sector classification are currently not available, individuals are being analysed under the name of the household sector.

[5] The change to data request from credit institutions, i.e. that to the classification of loans to sole proprietors and non-profit organisations, reflects two opposing influences – exclusion of sole proprietors from the corporate sector has reduced the outstanding total, while inclusion of non-profit institutions relating to the corporate sector has increased it. The base data cannot be adjusted according to the new data reporting obligation, therefore, the data for the end of 2001 H1 are not directly comparable with those for earlier periods. Although to a small extent, this problem affects all charts and data which are related to lending to businesses.

[6] Currently, outstanding Lombard loans in Hungary are comprised of lending against security as collateral.

[7] The fall in the deflator (industrial producer price index) explains the larger part of the strong pick-up in real growth in the first half.

to reduce excess risks are limited due to the relative underdevelopment of domestic derivatives markets. As a result of these factors, the ratio of total foreign currency loans to the corporate sector (in forint terms) fell from 39.4 per cent to 36.2 per cent in 2001 H1. Looking at the maturity breakdown of outstanding corporate loans, the gradually slowing increase in the proportion of long-term loans in the previous couple of years was followed by a decline in 2001 H1, with their percentage falling from 53.7 per cent at end-2000 to 52.5 per cent in the period under review.

Outstanding forint lending to the corporate sector increased by 8.9 per cent in nominal terms in 2001 H1, relative to 7 per cent a year before. The rise in total short-term loans accounted for the larger part of this increase, which resulted in the ratio of short-term loans to total outstanding forint-denominated loans to the sector rising by one percentage point, to 56.4 per cent.

The very robust lending activity is not aimed exclusively at the best debtors. The spread between short-term corporate borrowing rates and risk-free market rates rose a little in 2001 H1 relative to that seen in 2000 H2, but it broadly remained below the value of around 1.5 per cent recorded in earlier years. The relatively thin risk premium would not necessarily provide adequate cover for value losses incurred due to a potential worsening of loan portfolios during a cyclical downturn (see Chart 2.7).

The outstanding total of long-term investment loans denominated in HUF has been rising for the second consecutive year now, amounting to HUF 371.5 billion at the end of 2001 H1. New extensions to companies amounted to HUF 91 billion during the period, compared with HUF 77 billion in the same period a year earlier.

Outstanding foreign currency loans to the corporate sector fell by more than 5 per cent as a net result of variations in the forint exchange rate (–8.3 per cent) and cross exchange rates (+3.2 per cent), with the transaction effect being insignificant. The strongly negative contribution of variations in the forint exchange rate on outstanding lending was concentrated in the May–June period, due to the strong appreciation of the domestic currency following the move to widen the intervention band in early May (see Chart 2.8). The fall in outstanding foreign currency loans affected mainly short-term loans, while more than two thirds of total foreign currency loans outstanding to the corporate sector have maturities of over one year. At the end of 2001 H1, the forint equivalent of euro or loans denominated in a member currency accounted for 62.3 per cent of total foreign currency loans.

The increase in the volume and percentage of commercial property development loans, lasting for the previous 18 months, stalled in 2001 Q1, with the subsequent decline observed in the second quarter lacking real substance, as this stemmed solely from the appreciation of the forint exchange rate. Almost all loans (99 per cent) for financing the construction of office buildings and retail shopping centres are foreign currency loans, the forint equivalent of which fell due to the considerable exchange rate effect, while the transaction effect was positive. As both the volume and percentage share of loans financing construction and development of commercial property are small, the risk of a price bubble developing in the property market is insignificant at the level of the banking sector as a whole (see Chart 2.9). Four large banks continue to account for the vast bulk of outstanding loans. The combined share of these within total loans by the four banks outstanding to the corporate sector is almost double that registered by the bank-

***Chart 2.7* Spread between corporate loans rates and risk-free market rates**

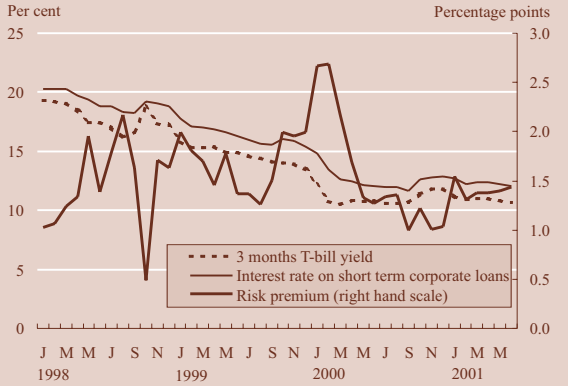


***Chart 2.8* Components of changes in corporate sector foreign currency loans (cumulated effects since 1999)**

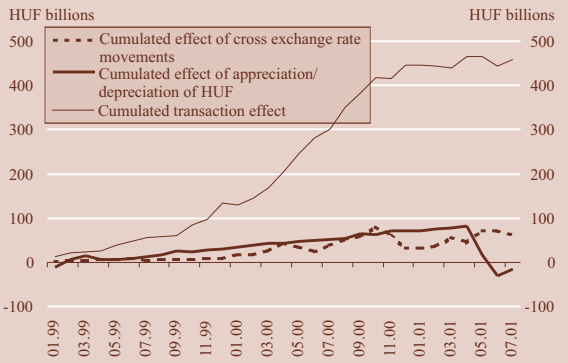
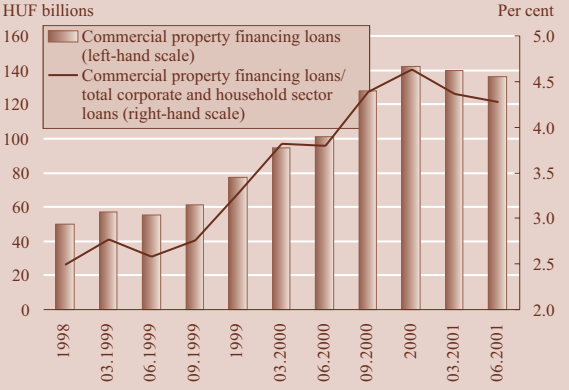
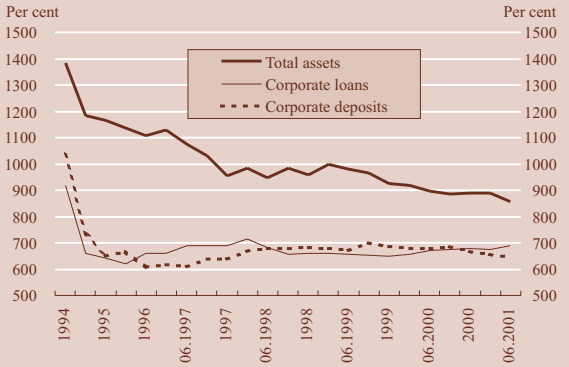


Chart 2.9* Property development loans



* Loans for construction and development of commercial property (offices, business centres, etc.).

Chart 2.10 **Market concentration of corporate sector loans and deposits, and the balance sheet total**
(Herfindhal index)



ing sector. This, however, does not represent a considerable risk factor for these banks, although it may have a negative effect on their future earnings, as an increase in oversupply may mar the quality of loans, and value losses on project loans may increase.

The sectoral breakdown of outstanding loans changed little over the period under review. Continuing the trends of earlier periods, lending to agriculture and the food industry as a share of total lending declined. By contrast, lending to refined petroleum product manufacturers and chemical product manufacturers as well as to firms in the transportation, storage and post and telecommunications sector continued to rise. The pick-up in domestic currency lending played an important role in the percentage share of this latter sector increasing. The trade, repair of motor vehicles and household goods sector saw its share fall in 2001 H1, unlike the developments seen in the previous year. Of note were the decline in the share accounted for by engineering, owing to the massive decline in outstanding foreign currency loans, and the increase in the share of real estate, renting and business activities, owing to the higher momentum of foreign currency lending to the sector.

Banking activities in the corporate market have been characterised by a low degree of concentration for years now, due to the intense competition for business. However, as a result of mergers currently underway and those expected to be finalised soon, concentration is expected to pick up over the near term. It should be noted that, whereas the degree of concentration in the corporate deposit market has been falling in the past 18 months, it has been increasing in the loan market (see Chart 2.10).

Growth in corporate lending may slow down somewhat in the near future, due to the slacker economic growth, the effects of the forint appreciation on the real economy, the expected worsening of corporate sector profitability, the tightening of banks' liquidity position and the potential deterioration in loan quality.

Box 2.1 Concentration of bank lending and corporate debt dynamics

The August 2000 issue of the Report on Financial Stability contained an analysis of banks undertaking high risks, and particularly the concentration of lending. Representing a major risk factor for the Hungarian banking sector, the outstanding amount of loans to the 50 largest corporate debtors by the 10 largest banks accounted for 40 per cent of total outstanding lending to the corporate sector, provided to a total 310 businesses, in 1999. This raises the question whether the statement, which is treated as a matter of fact, that Hungarian firms' indebtedness is not excessive and therefore an increase in indebtedness arising from a potential credit expansion will not unduly increase the lending risks undertaken by the banking sector, also applies to this range of corporate debtors. The latest data base for 1999, available from the APEH, the Hungarian tax authority, offered a good opportunity to analyse the balance sheet structures of businesses that could be identified based on their code numbers and to look at the significant differences across the balance sheet structures of the corporate sector as a whole and the narrow range of businesses that determine banks' outstanding loan portfolios.

The data base and the method of analysis

The analysis covered 16 banks playing a dominant role in lending to the corporate sector. The combined share of these banks in loans outstanding to businesses was 87.2 per cent in 1999 and 88.9 per cent a year later. At the same time, their share of total outstanding lending was 85.4 per cent and 86.5 per cent in 1999 and 2000, respectively.

When processing the data belonging to the category of high risks (data reporting to the Hungarian Financial Supervisory Authority (PSZÁF), X. Tables), assets vis-à-vis the 50/49 largest debtors enlisted were recorded together with the code numbers allowing for identification of the debtor. One problem when analysing the data base of APEH for 1999, is that the data base was altered continuously, with changes to the details of individual elements being important for the analysis of the balance sheet structure. In the case of long and short-term liabilities, this meant that the size of bank loans could not be established within total liabilities.

When recording the code numbers, only the banks' reports could be relied upon, hence there was no possibility to rectify any incorrect identification numbers they provided. Overall, banks reported data on 930 large domestic debt-

ors. In addition, they assigned a number of foreign clients, the majority of which were banks, although they included a few large corporate clients as well.

The National Bank identified 838 clients out of the total 930 on the basis of the code numbers. This means that some 10 per cent of clients cannot be identified based on their data reports to the PSZÁF. The 838 clients were further narrowed, setting aside financial institutions and businesses providing other financial services, clearly owned by banks, and those operating with the purpose of maintaining banks' infrastructure. As a result, the balance sheet structures of 764 businesses were analysed. These companies account for around 52 per cent, or HUF 1,091 billion, of loans provided by the Hungarian banking sector to non-financial corporations. Of note is the fact that the share of the 50 largest debtors is narrowly less than 20 per cent (HUF 399 billion).

When analysing the balance sheet structures, only the ratio of own funds to total liabilities could be assessed.

The results

The balance sheet structure of the largest debtors provides the most relevant information for the interpretation of banking sector risks. For the purposes of the analysis, the 50 businesses with the largest debts were selected, out of which only 44 could be identified based on the code numbers. One was missing from the upper ten and 2 from the upper 20 businesses. Nevertheless, it is felt that proper conclusions can be drawn from the results.

The equity ratio was 41.7 per cent in businesses with the largest debts, which was lower than the average 45.2 per cent for the entire corporate sector in 1999.[8] The table below summarises the debt-to-equity ratios and capital gearing of the upper 5, 10, 20 and 50 businesses with the largest debts:

	Number of business with the largest debts				764
	5	10	20	50	
Debt-to-equity ratios	51.4	51.6	49.8	49.8	41.7

Based on the indicators, the indebtedness of the largest debtors is obviously not considerably higher than that of the entire corporate sector, and those of the 5, 10, 20, and 50 largest businesses are smaller than that of the non-bank corporate sector. So, if the degree of corporate sector indebtedness is not judged to be excessively risky, then this statement can be extended to the range of businesses accounting for the dominant part of banks' outstanding loans, and it is especially valid for the largest debtors. Provisions formed for the 50 largest debtors are only 19 per cent of those formed by the entire banking sector; however, eliminating the provisions formed for the two largest bad debtors (accounting for nearly two-thirds of the total), the indicator is 5.2 per cent, as the overwhelming majority of large debtors is problem-free.

Taking into account the low level of businesses' indebtedness, and the low volumes of lending in the partial markets threatened by potential development of a price bubble, the risks to the banking sector associated with lending to businesses is not judged as being high.

Lending to households

The growing momentum of lending to households in previous years was maintained in 2001 H1. Whereas the past growth in lending was solely attributable to the fast increase in consumer credit and other loans, in particular car purchase finance, the growth rate of housing loans has increasingly exceeded that of consumer credit and other loans recently. Housing loans are expected to continue to increase their share in the future. There are several reasons for this. First, the government's programmes to support residential construction will likely play a major role. Second, the Hungarian housing loans-to-GDP ratio is just a fraction of that registered in developed European countries. Third, in contrast with international experience, the size of outstanding consumer credit in Hungary well outweighs that of outstanding housing loans at present. The rearrangement of outstanding loans to households will likely have an effect on their risk exposures, as the pick-up in outstanding loans not only increases the debt burden of the sector, but the average burden on individual households as well, taking into account the higher average

[8] Cf. 'Corporate sector financial data, 1998–99', CSO, 2001.

Chart 2.11 **Market concentration of household loans and deposits** (Herfindhal index)

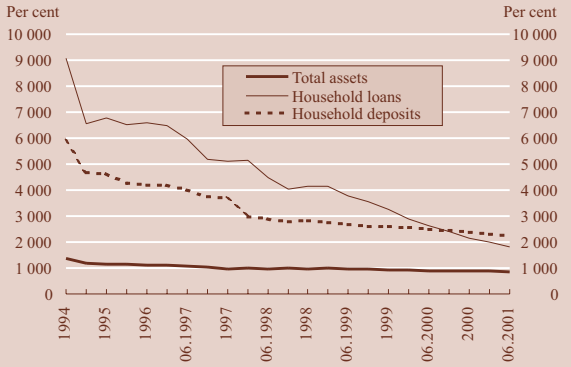


Chart 2.12 **Interest rate on and demand for personal property loans**

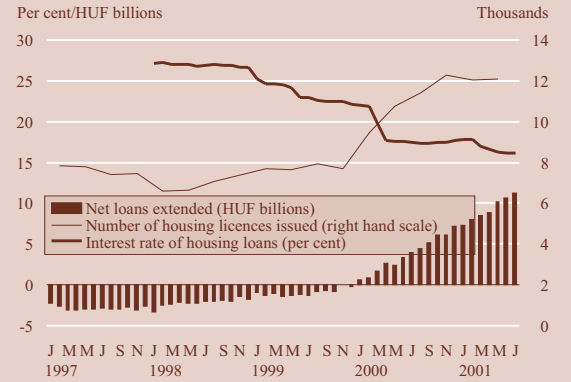


Chart 2.13 **Interest rates on new loans to households**

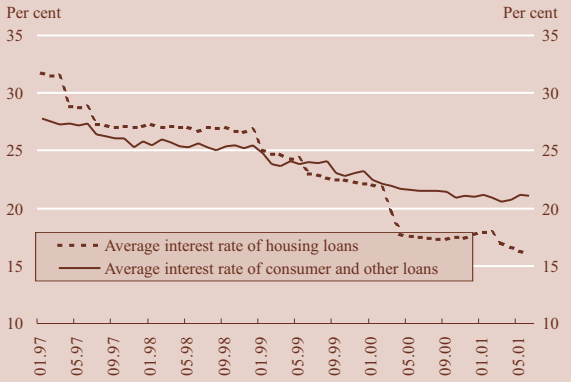
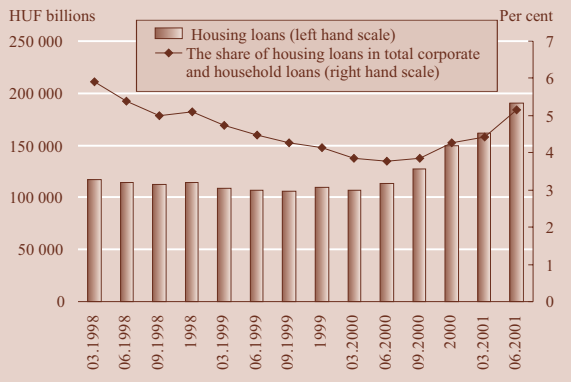


Chart 2.14 **Housing mortgage loans**



amount of housing loans. Banks' outstanding housing loans to individuals[9] increased by 20.6 per cent in 2001 H1, compared with 15.9 per cent in 2000 H1. Taking into account the ratios of outstanding loans to GDP and the banking sector's balance sheet total, which fall well short of comparable indicators for developed countries, as well as the low level of households' indebtedness in relation to their financial wealth, the expansion of personal lending will likely continue in the future. There has been a fall in the degree of concentration in this market segment, simultaneously with growth in personal lending (see Chart 2.11). Almost all of the loans outstanding to households (97.2 per cent) are forint loans. The share of long-term loans has been stable around 88 per cent for two years now.

The outstanding total of housing mortgage loans[10] has been rising vigorously for a year now (in 2001 H1, it rose by 27 per cent). This spectacular rise can be traced to several factors. One of these is the low base – due to the repayment of older, more costly loans, outstanding loans declined through to the end of 1999 instead of rising. In addition to the low base, the implementation of the government's home-building subsidy programme and the gradual increase in preferences have contributed enormously to the rise in demand for housing loans. Thanks to subsidies granted to build new homes, the supply of new dwellings is also rising, underlined by the swift increase in the number of residential construction permits in the past 18 months.[11] Another important factor explaining the rapid build-up of housing loans is the fall in housing loan rates. With the general interest rate level remaining broadly unchanged, housing loan rates fell by 2 percentage points in the period January–August 2001 (see Chart 2.12).

Owing to the competition induced by preferential loan facilities, the average interest rate on housing loans, provided under market conditions, fell significantly in March–April 2000. As a result, average housing loan rates are now much lower than those on consumer credit and other loans (see Chart 2.13). Taking account of the fact that lower interest rates carry lower risk premium, the importance of collaterals (i.e. mortgages) has increased as a result of the vast drop in interest rates. The proportion of housing mortgages within lending to the corporate and household sectors has been on an upward trend, but currently it is not excessively high, so the risks to the banking sector of a price bubble potentially developing in the property market remain insignificant for the time being (see Chart 2.14). At the end of 2001 H1, housing loans accounted for nearly 37 per cent of loans to households, and for more than 52 per cent among those provided by the five largest banks.[12] Concentration in the housing loan market segment is even stronger than in the whole market of loans to households. The five largest Hungarian banks held a 73 per cent share of total housing loans outstanding in the period under review.

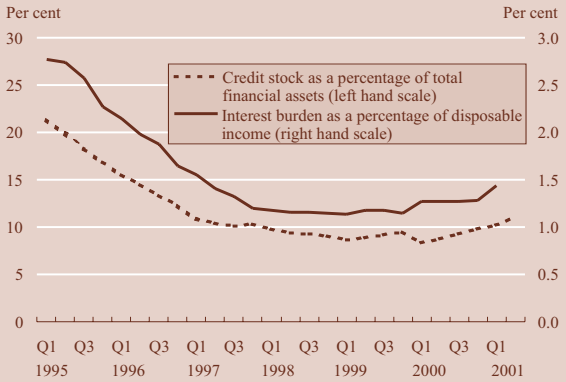
[9] Excluding sole proprietors, given that they are not included in the base. Taking into account that the analysis covers only outstanding loans of the banking sector to individuals (lending by savings cooperatives is not part of the analysis), minor differences may arise from those presented in Chapter 1.
[10] For the sake of a better comparison, sole proprietors are excluded.
[11] All this entailed a stabilisation of used homes prices following the fast increase in previous years. Moreover, there was a slight drop in prices in certain categories, as those building new homes financed constructions by selling their old dwellings, as a result of which there was an increase in supply of used homes.
[12] For the sake of a better comparison, sole proprietors are excluded.

Outstanding consumer credit and other loans[13] rose very strongly, by 17 per cent in the first half, compared with an increase of 23 per cent in the same period of the previous year. This slowdown in growth was partly attributable to the upward trend of car purchase finance apparently having hit a peak. Within outstanding consumer credit and other loans, the share of long-term loans has been stable at around 82 per cent for the past two years. Banks have not as yet launched price competition in the consumer credit market The average interest rate has fluctuated around 21 per cent since the beginning of the year, with an above 10 per cent real rate of interest, characterising also the previous years. Coupled with the still high growth rate of consumer lending, this fact seems to be evidence of a low interest sensitivity of demand for consumer credit.

The pick-up in household sector borrowing in past years is also reflected in the tentative rise in interest burden. However, the value of this indicator is still seen as very low, so a change in interest rate levels will not likely have a material influence on this sector's ability to service its debt (see Chart 2.15).

The risks inherent in bank lending to households are not seen as excessive, taking into account the low level of personal indebtedness relative to households' financial wealth. The risk premium content of interest rates charged on lending is presumed to be adequate to cover a large-scale default ratio, expected over the longer term based on international experience. Another factor suggesting that banks exercise caution in lending is that they take into account properties and other sorts of security at low value.

***Chart 2.15* Outstanding loans to households and the interest rate burden**



Contingent liabilities

Banks' undertaking of contingent liabilities appears to be closely correlated with their lending activities, as clients probably use a part of credit lines granted under various conditions for borrowing purposes.

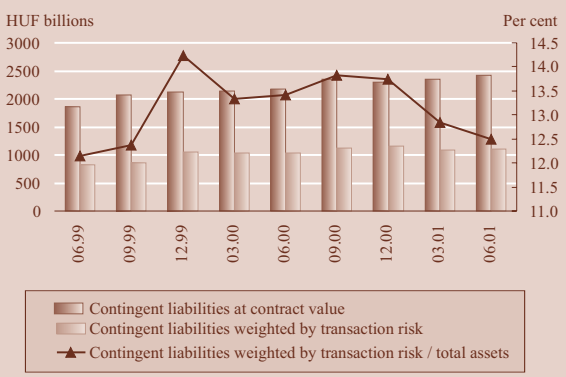
The stock of banking sector contingent liabilities shows some within-year variations, but the generalised trend remains upwards. Taken at contract value, the rate at which outstanding contingent liabilities grew in 2001 H1 was comparable with that of the balance sheet total, unlike in the previous year when it grew more slowly.

The value of contingent liabilities weighted by transaction risk rose relative to June 2000 but fell relative to December, as was the case a year earlier. This was the result of a shift in the structure of liabilities undertaken. The stock of liabilities weighted by transaction risk fell to 12.5 per cent as a share of the balance sheet total (see Chart 2.16).

The outstanding stock of full-risk and risk-free transactions increased in 2001 H1, while that of those carrying lower risks fell. Guarantees and credit lines granted under various conditions dominate contingent liabilities undertaken by banks, their percentage being 90 per cent. Nearly 80 per cent of these liabilities are forint-denominated.

Banks undertake around 80 per cent of contingent liabilities vis-à-vis non-financial corporations. This share fell by 2–3 per-

***Chart 2.16* Banks' contingent liabilities**



[13] For the sake of a better comparison, sole proprietors are excluded.

centage points towards the end of 2000, and remained largely unchanged in 2001 H1. The proportion of contingent liabilities undertaken vis-à-vis credit institutions rose from 10 per cent to 12 per cent, but most of them were zero risk weighted credit lines related to credit cooperatives' required reserves.

Country risk exposure[14]

The total value of banks' risk exposures to non-residents rose in nominal terms relative to both end-June 2000 and end-December, despite the data for end-June being recorded on a net basis (see Table 2.1).

The volume and percentage share of risk exposures to risk-free (class 1) countries rose further in the period under review, in contrast with those to high-risk countries, notably Russia, which fell overall (see Chart 2.17). Nearly 90 per cent of exposures undertaken by banks vis-à-vis non-residents were to countries belonging to class 1, qualified as carrying no country risks.

On-balance-sheet items continue to dominate Hungarian banks' exposures to non-residents, their share being 84.6 per cent. Approximately 10 per cent of claims in the banking sector's balance sheet are vis-à-vis non-residents. Interbank deposits, at 50 per cent, and loans, at 42.4 per cent, account for the largest shares within balance sheet items.

The concentration of risk by country remained virtually unchanged relative to the end of 2000. Four countries continue to account for more than one-half of banking sector exposures to non-residents. That, however, does not represent a serious risk, as each of these countries belongs to category 1, qualified as carrying no risk. Around 90 per cent of exposures continue to be vis-à-vis 15 countries, 12 of which categorised into the risk-free class.

Risk exposures to Russia still constitute the only notable source of risk for the domestic banking sector as a whole, but the trend measure of risks undertaken vis-à-vis Russia has been downwards recently. A number of Hungarian banks have significantly cut back on their transactions in Russia. As their deals with Russian residents generally are denominated in US dollars and the forint/dollar exchange rate at the end of the first half was practically unchanged compared with the end-December exchange rate, the transaction effect accounted for virtually the whole decline in exposures.

Portfolio quality

Up 8.4 per cent, Hungarian banks' asset portfolio continued to rise strongly in the first six months of 2001, with a simultaneous shift within the overall portfolio towards on-balance-sheet items. Whereas on-balance-sheet items increased by 16 per cent in the period, off-balance-sheet items fell in nominal terms, by

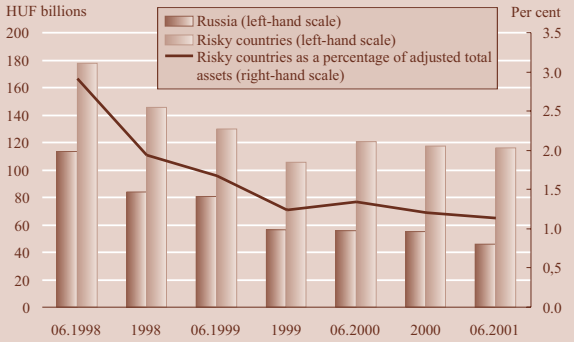
Table II.A **Composition of banks' exposures to non-residents**

Per cent

	2000				2001	
	H1		H2		H1*	
	Ft billions	%	Ft billions	%	Ft billions	%
Category 1	852,874	87.6	791,180	87.1	965,490	89.2
Category 2	44,783	4.6	31,485	3.5	28,036	2.6
Category 3	14,941	1.5	27,686	3.0	29,652	2.7
Category 4	61,205	6.3	58,484	6.4	58,616	5.4
Russia	55,494	5.7	54,961	6.0	45,871	4.2
Total	973,803	100.0	908,835	100.0	1,081,793	100.0

* At net value.

Chart 2.17 **Country risk exposures of banks**



[14] Due to the change to the data reporting system, the data are on a net basis. Data for earlier periods are not comparable even using adjustments, as value losses on the individual items cannot be identified in the country risk analysis. In the earlier Reports, the contract values of forward transactions had a 10 per cent weight when weighting off-balance-sheet items. Currently, the actual weighted value has to be taken into account.

4.4 per cent.[15] This meant that within the total portfolio the proportion of on-balance-sheet items rose from 62 per cent to 66 per cent.

The change in the pattern of assets had an effect on overall portfolio quality as well. Taking into account that for years banks have continued to qualify virtually all (some 97 per cent) of their off-balance-sheet items as problem-free, the decline in this portion of the portfolio has had a negative influence on the overall picture. Looking at the aggregate portfolio, the stock of problem-free assets slipped from 91.5 per cent to 91.3 per cent. It should be noted, however, that this process has been observable from the second half of the previous year, although it has been less evident (see Table 2.B).

Beyond the effects of the shift in proportions, analyses focusing solely on items on balance sheet show an unchanged portfolio quality, which suggests that the process of quality improvement which began in the period following the Russian crisis has faltered. In the National Bank's judgement, this does not yet pose stability problems at the sectoral level. Nevertheless, it was noted in the previous Report that robust lending activity might lead to a deterioration in portfolio quality over the longer term, especially if cyclical conditions were to take an unfavourable turn. Hungarian economic conditions have been worsening somewhat since the second half of the previous year, although the country's 4 per cent economic growth is still considered outstanding by international standards.

Within banks' portfolio calculated for the individual on-balance-sheet items only, problem-free assets have a 88.3 per cent share, showing an insignificant increase, compared with the 88.2 per cent share at the end of the previous year. There was a slight shift within rated items across the various categories of asset quality, but the offsetting effects of these mostly cancelled each other out. While the shares accounted for by substandard and doubtful items fell back, there were slight increases in the special watch category, registering low loss rates, and bad category, registering high loss rates (see Chart 2.18). However, the increase in the proportion of bad assets was not universally true for the sector: it was concentrated in four large banks, with an insignificant share of these transactions within their balance sheets.

The structural realignment within the portfolio led to the proportion of weighted rated assets[16] easing off slightly, from 2.56 per cent to 2.45 per cent, indicating lower aggregate risks. However, it should be noted that, as a reflection of significant changes to data reporting, the data for 2001 H1 do not allow us to draw firm conclusions, and annual data will likely provide a more reliable picture of developments.

This statement is valid for banks' household lending portfolio as well, the fast increase in outstanding lending to the sector justifying a separate analysis. Lending expansion has not yet been accompanied by a perceptible deterioration in portfolio quality – problem-free assets accounted for an 87.5 per cent share at end-June compared with 87.8 per cent at end-2000. Unfavour-

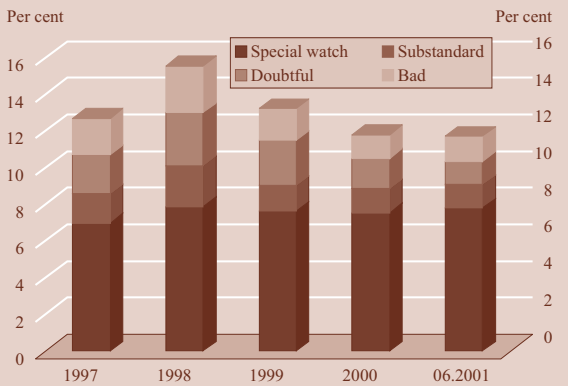
[15] This fall does not necessarily imply a shrinkage of activity, given that with the introduction of the regulation on the trading book, a large part of banks' derivatives activities has no longer been recorded in the banking book and, simultaneously, within risk weighted assets by banks keeping a trading book.
[16] The weighting used within individual rating categories are as follows: 5 per cent in the special watch, 20 per cent in the substandard, 50 per cent in the doubtful and 85 per cent in the bad asset class.

Table 2.B **Composition of rated portfolio**

Per cent

	2000	June 2001
Problem-free	91.5	91.3
Rated assets	8.5	8.7
Of which:		
Special watch	5.7	6.0
Substandard	0.9	0.9
Doubtful	1.1	0.9
Bad	0.8	1.0
Total	100.0	100.0

Chart 2.18 **Quality of banking sector balance sheet items**



ably, though, the percentages have shifted slightly towards lower asset categories. However, caution is required here when interpreting the data, as the range of items constituting banks' household asset portfolio has been enlarged by new categories, so the base data and the actual data are not directly comparable.

The method of provisioning was changed considerably as well in May 2001 – the regulations provide for accounting for loss in value instead of the earlier risk provisioning system applying to the qualified portfolio. Comparing losses accounted for in the various categories of asset quality with risk provisions formed in previous years, loss in value relative to the qualified stock (equivalent to the term 'provisions coverage') rose in each category. This increase ranged between 1.5 per cent and 2 per cent on average in the individual categories, and reached 3.2 per cent, 22.6 per cent, 50.9 per cent and 90.5 per cent respectively in the special watch, substandard, doubtful and bad asset classes.

Developments in portfolio quality apparently do not pose a problem for banking sector stability in the near term, and the measure of losses accounted for shows an adequate picture as well, which is an indication of banks' cautious approach to asset valuation policy. The Bank feels that the measure of medium and long-term risks largely depends on future developments in the real economy and, in particular, the cyclical variations in lending activity.

Market risks

Interest rate exposure

Following the clear, though temporary, rise in interest rates in the final quarter of 2000, banks' interest rates were stagnant throughout 2001 H1. Without guidance from clear expectations of official interest rate reductions, banks reduced further their forint re-pricing gap.[17] A slight increase in the banking spread was beneficial for interest income in the first half; and there was a narrow improvement in the interest-bearing assets-to-interest-bearing liabilities ratio (see Table 2.C).

The cumulative 90-day re-pricing gap narrowed by HUF 106 billion and the gap as a percentage of the balance sheet total by 1.5 percentage points relative to end-2000. Within the balance sheet the percentage share of forint assets with re-pricing periods of up to 90 days rose from 79 per cent at end-2000 to 80 per cent at the end of 2001 H1, while that of forint liabilities with re-pricing periods of up to 90 days remained at 91 per cent. Consequently, the re-pricing structure of interest-bearing assets and interest-bearing liabilities remained broadly static, and so the narrowing of the gap was explained mainly by the volume of interest-bearing forint assets rising at a stronger rate than that of interest-bearing forint liabilities.

The cumulated 90-day foreign exchange re-pricing gap narrowed by HUF 129 billion, and its percentage of the balance

Table 2.C **Major indicators of banks' interest rate exposure[18]**

	December 2000	June 2001
90-day cumulated forint gap (HUF billions)	–482.2	–375.0
90-day cumulated foreign exchange gap (HUF billions)	–170.9	–42.0
90-day cumulated forint gap/balance sheet total	–5.7%	–4.2%
90-day cumulated foreign exchange gap/balance sheet total	–2.0%	–0.5%
	2000 H1	2001 H1
Average of interest-bearing assets/average of interest-bearing liabilities	108.7%	109.3%
Interest margin (interest income/average balance sheet total)	3.87%	4.06%
Spread (interest income/average of interest-bearing assets – interest expenditure/average of interest-bearing liabilities)	3.60%	3.84%

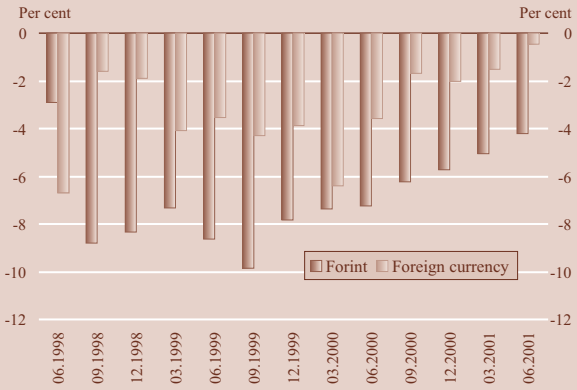
[17] The re-pricing gap is defined as the difference between interest-bearing assets and interest-bearing liabilities re-priced in a given period. When the change in the direction of the gap is being discussed, the absolute value of this difference is taken as a basis. Consequently, the narrowing of the gap characterising forint items implies a reduction in the open interest position and, as a result, the interest rate exposure.

[18] The re-pricing gaps have been calculated excluding the off-balance-sheet items of Takarékbank.

sheet total by 1.5 percentage points, becoming nearly neutral. The re-pricing structure of interest-bearing foreign currency assets and interest-bearing foreign currency liabilities changed significantly relative to the forint side, due to a shortening of the average re-pricing period for assets. The percentage share of foreign currency assets with re-pricing periods of up to 90 days rose from 73% to 79%, while that of foreign currency liabilities with re-pricing periods of up to 90 days fell from 82% to 80%.

Taken together, measured by the re-pricing gap, banks' interest rate exposure reduced further both on the forint and foreign currency sides in 2001 H1, continuing the trend of 2000 (see Chart 2.19).

Chart 2.19 **Banks' cumulated 90-day re-pricing gaps**



Exchange rate exposure

Banks' foreign exchange position on the balance sheet opened up in the first four months of 2001, but this did not entail a significant increase in the total open position, unlike in the latest period featuring pro-forint speculation, in early 2000. Banks were mainly deriving profits in the foreign exchange market from the forint's interest premium, while the exchange rate exposure remained low at the sectoral level.

Following the Hungarian authorities' move to widen the exchange rate band on May 4th, banks wound down their on-balance-sheet long forint positions up to the first week of June, while the currency continued to appreciate under the impact of demand generated by foreign investors. From mid-June, banks once more began building up their on-balance-sheet long forint positions strongly, which the depreciation of the forint influenced by the Argentinean crisis interrupted for a short while, and, after the turbulence had abated, on-balance-sheet long forint positions reached their peak at the end of July.

Banks' total short foreign exchange position closed down following the move to widen the intervention band of the forint. Following this, in accordance with earlier trends, banks attempted to hold a slight, though long, foreign exchange position (see Chart 2.20). This latter phenomenon can be explained by the fact that, as a result of the uninterrupted appreciation of the forint up to July, the chance of a future depreciation also increased, even after the passing of the Argentinean crisis. In the period mid-June–early August, simultaneously with the on-balance sheet open position opening up, banks' outstanding derivatives deals rose robustly. Over-the-counter transactions accounted for most of this increase, with the result that the proportion of OTC deals within banks' derivative FX transactions rose from 88% at end-April, i.e. the time of widening the intervention band, to 92% towards end-July.

Throughout the first four months of the year, utilisation by banks of their open position limits, set at 30% of regulatory capital, fluctuated at low levels characterising 1999 and the second half of 2000, in harmony with developments in the total foreign exchange position, then it continued to slow even further in the months following the move to widen the intervention band (see Chart 2.21).

Taken together, the banking sector's exchange rate exposure was at low levels both before and after the authorities' move to widen the intervention band of the currency.

Chart 2.20 **Total and balance sheet open position of banks**

* Poitive value: long foreign exchange position.

Chart 2.21 **Utilisation of limits for open position**

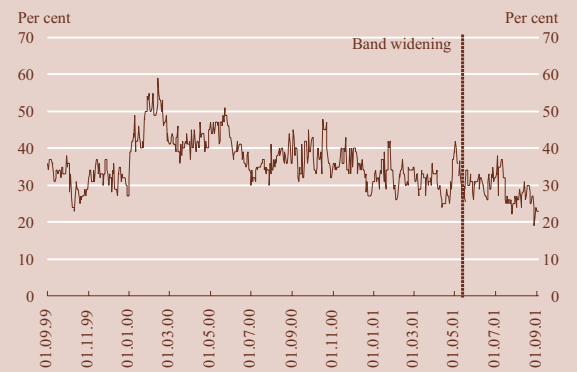


Chart 2.22 **Loan-to-deposit ratio in the banking sector**
Using average stocks

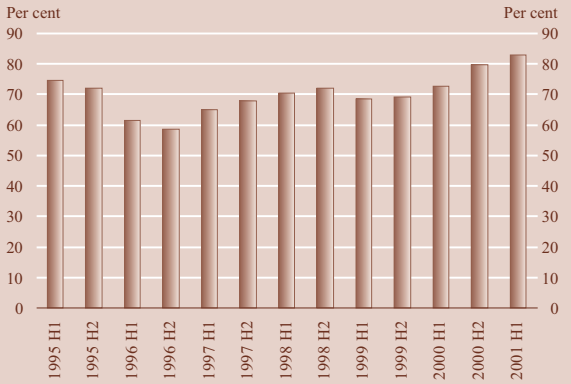


Chart 2.23 **Liquid asset ratio**

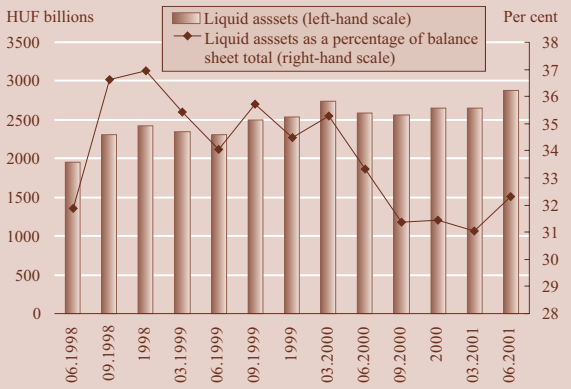
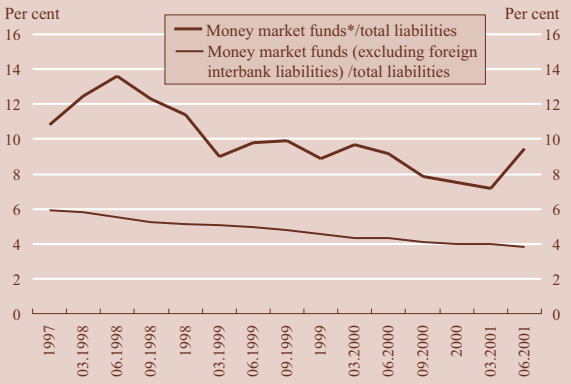
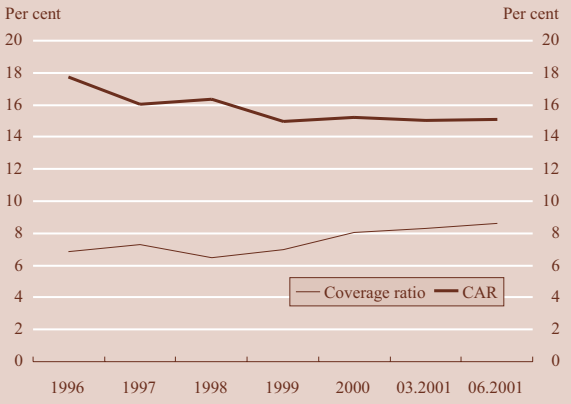


Chart 2.24 **Money market exposure**



* Money market liabilities: short term interbank liabilities + central bank repo.

Chart 2.25 **Capital adequacy and coverage ratios**



Liquidity

Banks' loan-to-deposit ratio increased further in the period under review, from 79.6 per cent in 2000 H1 to 82.8 per cent. The rate of lending growth, though less robustly, exceeded that of deposits (outstanding household forint deposits, accounting for the largest share, increased by only 3.1 per cent nominally in 2001 H1, with corporate sector deposits stagnating). One warning sign is that the market share of banks with loan-to-deposit ratios of above 100 per cent, calculated from balance sheet data, rose from 33 per cent to 42 per cent. It should be noted that, after eliminating the strong appreciation of the forint following the widening of the intervention band, the loan-to-deposit ratio rose even more strongly, as foreign currency accounted for a larger share within total lending than within deposits (see Chart 2.22).

Looking at both the assets and liabilities sides, the banking sector as a whole is seen as being in a comfortable situation in terms of liquidity. First, the ratio of liquid assets[19] to balance sheet total[20] is sufficiently high. Second, based on the liabilities structure, it can be seen that banks overall do not rely too extensively on money market funds regarded as the most volatile source of finance. The ratio of liquid assets to the balance sheet total rose slightly in the period under review, with an increase in the proportion of government securities and interbank lending within liquid assets (see Charts 2.23 and 2.24).

Combined liquidity of the five largest Hungarian banks is judged as adequate; however, the picture excluding OTP, traditionally registering very good liquidity, is somewhat less impressive. The nearly 100 per cent loan-to-deposit ratios of the four largest banks behind OTP, rising 10 percentage points from a year before, are coupled with slightly low levels of liquid assets-to-balance sheet total ratios. This may represent a hurdle to further growth in the future, or may also result in a fall in profitability as a result of banks obtaining more costly funds.

Capital strength and capital adequacy

The banking sector's capital adequacy ratio (CAR) was 15.1 per cent at end-June, practically equal to that at the end of the previous year (15.2 per cent), thus the sector's stability is seen as secure in terms of capital strength. CAR figures for every member of the sector reach the statutory minimum of 8 per cent. The proportion of banks with CAR below 10 per cent fell in the period under review (see Charts 2.25 and 2.26).

However, there have been a number of changes in the method of calculating CAR, which makes it more difficult to compare the outcomes for various periods and to assess the underlying developments. Within those changes, the recognition of general risk provisions as a constituent part of core (or primary) capital elements and the introduction of the trading book are of special im-

[19] Liquid assets comprise cash, settlement accounts, holdings of treasury bills and government bonds (excluding consolidation government bonds), NBH bills, 0–14 day interbank and central bank deposits.
[20] Problems with the analysis of banking sector assets side forint liquidity remain to be answered, as the currency breakdown of 0–14 day interbank and central bank deposits is currently not available.

portance. This latter influenced the values of both regulatory capital and the risk weighted assets in 2001 H1.

A favourable development for the structure of regulatory capital was the further increase in core capital elements, which, however, should be interpreted with caution, as it was entirely the result of the changes to regulations, as noted earlier. General risk provisions alone raised core capital by HUF 58 billion and the capital adequacy ratio by 1 percentage point. Eliminating this item, core capital would have increased by only HUF 10 billion.[21]

In contrast with the developments of previous years, additional (or supplementary) capital fell even in nominal terms. These capital elements are practically accounted for by subordinated loan capital. Currently, supplementary capital makes up 15 per cent of core capital, so banks still do not use the advantages offered by the law which would allow for a 100 per cent supplementary-to-core capital ratio (and a 50 per cent subordinated loan capital-to-core capital ratio). Taking into account the fact that in a potential crisis situation banks generally have easier access to supplementary capital, e.g. in the form of subordinated loan capital, it is a sign of long-term stability of the domestic banking sector that high limit utilisation does not impede the use of this form of capital (see Table 2.D).

A special feature of the Hungarian regulations is that the rule on investments and large exposures allows banks to overrun the prudential limits expressed as a percentage of regulatory capital, if the banks provide 100 per cent cover for these excesses in capital, i.e. if they subtract it from their regulatory capital.

Limit overruns amounted to HUF 54 billion at the end of the first half, showing no change relative to the end of 2000. However, it is seen as unfavourable that this reduced the sector's regulatory capital by 7 per cent.

The measures of limit overruns were particularly large, HUF 40 billion, at parent and subsidiary companies. Compared with this, the capital requirement of the trading book, an item to be deducted, was minimal, only HUF 11 billion in June.

The risk weighted assets increased by 7 per cent, a rate comparable with that of regulatory capital. There was a slight shift among the balance sheet items with various risk weights, with the fall in items with 100 per cent weights deserving special mention. This was partly attributable to the fact that the majority of foreign currency-denominated loans belonged to the 100 per cent weight risk category, and forint appreciation following the widening of the intervention band in May reduced the domestic currency value of foreign currency-denominated loans. The pick-up in housing mortgages, mostly denominated in the domestic currency, led to an increase in items with 50 per cent weights (see Table 2.E).

The introduction of the trading book brought a substantial change to off-balance-sheet items, as banks reclassified most of their forward claims into trading book items. However, the weighted value of these being minimal before the change, the new regulation barely changed the risk weighted assets.

[21] It should be noted that adjustments to capital due to OFI investments according to the new regulation does not affect core capital but should be subtracted from the sum of core and supplementary capital elements, in harmony with international standards. For the sake of a better comparison, the six-monthly data have been adjusted using this item, and core capital has been reduced by accordingly. This adjustment has accounted for HUF 45 billion.

Chart 2.26 **Market shares of banks with CARs below 10 per cent**

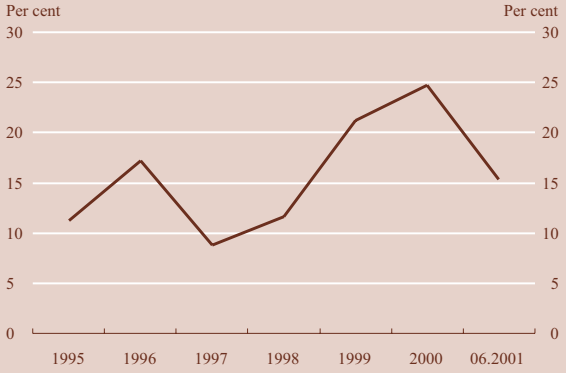


Table 2.D **Composition of regulatory capital**

Per cent

	2000	June 2001	June 2001/ 2000**
Primary (Tier 1) capital*	89.8%	92.9%	1.10
Supplementary (Tier 2) capital	17.2%	15.3%	0.95
Deductions: Amounts of limit excesses and country risk to be covered by capital	7.0%	6.8%	1.04
Uses of primary and supplementary capital to cover trading book exposures		1.4%	
Regulatory capital (HUF billions) = 100%	741	789	1.13

* Lowered by the amount of deductions due to OFI investments.
** The index values have been derived from incremental changes in the background data, and not from the percentage shares.

Table 2.E **Composition of the adjusted balance sheet total**
(risk weighted assets)

Assets at risk-weighted values (per cent)	2000	June 2001	June 2001/ 2000*
20 per cent weighting	4.7	4.9	1.12
50 per cent weighting	1.5	1.9	1.34
100 per cent weighting	74.2	73.7	1.07
Sum of weighted balance sheet items	80.4	80.5	1.07
Weighted value of contingent and other future liabilities	19.7	19.0	1.03
Weighted value of forward claims	1.3	0.5	0.44
Risk provisions (–)	1.5	0.0	0.00
Adjusted balance sheet total (HUF billions) = 100%	4,873	5,227	1.07

* The index values have been derived from incremental changes in the background data, and not from the percentage shares.

Taken together, the Hungarian banking sector's capital position continues to be stable, and the chances of receiving additional capital injections are seen as secure for the moment.

Profitability

The positive underlying trends of domestic banks' profitability which began to appear in 2000 continued in 2001 H1, although one-off factors explained a part of these profitability improvements. The banking sector registered salient, HUF 83 billion pre-tax profits in the period under review, more than 1.5 times higher than the profits registered in the same period of the previous year (see Table 2.F). Around 60 per cent of this increase stemmed from one-off factors. Of note among these were the positive net effects of a large-value transaction and the release of provisions ceasing to exist due to regulatory changes.[22] Compared with 2000 H1, the indicators of return on assets and equity reflect spectacular improvements – annualised first-half ROA rose from 1.41 per cent to 1.94 per cent and annualised first-half ROE rose from 16.4 per cent to 21.2 per cent.[23] Caution should be exercised, however, when drawing conclusions from the very strong outcomes for the first half by extrapolating them for the whole year to estimate the financial results for 2001, due to the effects which are unlikely to re-occur in the second half, already noted, and the seasonal patterns observable in banks' results.[24]

Net interest income, which makes up the largest part of operating results, increased by 18 per cent in nominal terms and by around 7 per cent in real terms, this having a very favourable impact on banking sector profitability. This was owing to a modest increase in the banking spread, in addition to a rise in the proportion of loans to clients generating higher profits within assets (see Table 2.G). As a result of the continuing growth in lending, the ratios of corporate and household loans to the balance sheet total rose to nearly 43 per cent in 2001 H1 from 37 per cent a year earlier (calculations based on average six-monthly totals). Another favourable effect on interest income was the increase in household lending, ensuring higher interest margin within loans to clients, although it still remained low (13 per cent, based on average six-monthly totals).

The continuing realignment of the balance sheet structure was reflected in the composition of interest income as well – interest income from loans rose from 51 per cent to 60 per cent as a share of total interest income relative to 2000 H1. Reflecting the significant effect of the uninterrupted growth in lending since the last third of 1999, this ratio was only 44 per cent in 1999 H1. Another factor contributing to the improvement in interest income was the more than 20-basis-point rise in the banking spread in 2001 H1 in comparison with the same period of the pre-

Table 2.F **Banking sector profits**

HUF billions

	2000. H1	2001. H1	Change
Net interest income	147.6	173.8	117.7%
Value losses/ change in provisions	3.5	–14.7	
Net commission revenue*	37.4	47.5	127.1%
Net profit from financial services	25.4	38.6	152.1%
Other net income	–16.0	–8.5	
GROSS PROFIT FROM FINANCIAL AND INVESTMENT SERVICES	197.0	236.8	120.2%
Costs of banking operations**	140.0	158.0	112.9%
ORDINARY PROFIT	57.9	78.7	135.9%
Extraordinary profit	–4.0	4.5	
PRE-TAX PROFIT	54.0	83.2	154.2%
Tax liability	7.1	7.4	
AFTER-TAX PROFIT	46.9	75.8	161.7%

* Includes only net income from financial services in 2000 H1 and that from financial and investment services in 2001 H1.
** General administrative costs from 2001.

Table 2.G **Decomposing spread**

	2000 H1	2001 H1	Percentage change
Average stock of interest-bearing assets (HUF billions)	7,037	7,921	112.6%
Average stock of interest-bearing liabilities (HUF billions)	6,476	7,248	111.9%
Interest income (HUF billions)	391	409	104.6%
Interest expenditure (HUF billions)	244	236	96.7%
Interest income/interest-bearing assets (per cent)	5.6	5.2	
Interest expenditure/ interest-bearing liabilities (per cent)	3.8	3.2	
Spread*	3.6	3.8	

* Annualised values.

[22] Release of provisions related to the sale by ABN AMRO of its insurance firm (MÉBIT) as well as those built for country and exchange rate risks. After eliminating these one-off effects from the pre-tax profits for the first half, the increase is still 10 per cent in real terms.
[23] Shareholders' equity minus profit in the denominator of ROE.
[24] For a discussion of the latter, see the Box on page 35 of the February 2001 Report on Financial Stability.

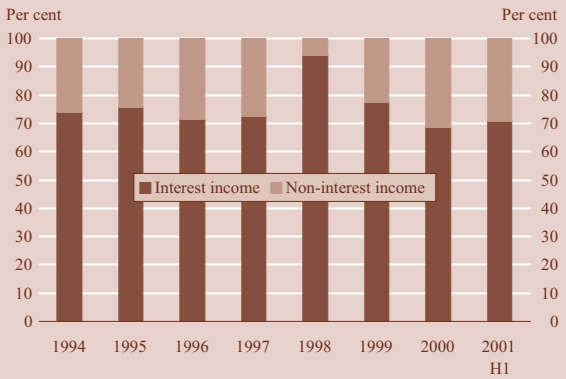
vious year, following the continued fall between 1995–99 and stagnation in 2000, as banks' average return on assets fell less strongly than their average costs of funds.

At 5 per cent in real terms, the increase in fee income was slightly weaker than that in interest income.[25] Profits of financial transactions fell by 2 per cent after eliminating the effect of the single large-amount transaction, already mentioned. Although profits of foreign currency trading and exchange rate gains rose strongly, profits of forward transactions and securities trading dropped off relative to the base period. Non-interest income dropped from 31 per cent in 2000 H1 to 29 per cent in 2001 H1 as a proportion of gross operating profits, so the pattern of Hungarian banks' did not undergo a shift towards the profile typical in the EU, unlike in the previous year.[26] However, expected reductions in inflation and official interest rates and, as a consequence, the shrinkage of interest income in the second half may lead to a reversal of this tendency taking the year as a whole (see Chart 2.27).

Value losses and changes in provisions reduced banking sector profits by around HUF 15 billion in 2001 H1. The slight deterioration in portfolio quality was reflected in profits mainly through a rise in the percentage share of bad assets entailing high value losses, although this negative impact was concentrated at just a handful of banks. Nevertheless, due to the major changes to accounting and data reporting rules, the impact of the change in portfolio quality cannot be judged with a high degree of certainty on the basis of sub-annual data. Therefore, a more reliable picture can perhaps be derived in this regard from the full-year results. The abolishment of provisions for country risk exposure and the release of provisions for exchange rate risk had a positive one-off impact on profits for 2001 H1, which is estimated at nearly HUF 10 billion collectively.[27]

Although only by a slight margin, operating costs increased faster than the rate of inflation in the first half relative to the comparable period of 2000. The 19-per-cent rise in personnel costs was responsible for the real increase in overall costs, while banks registered real savings on the various cost items (depreciation allowance, rents paid) compared with 2000 H1. Massive lay-offs related to the ongoing mergers partly explained the significant increase in personnel costs, on account of higher one-off disbursements.[28] Gross operating profits grew at a stronger rate than costs, so the cost efficiency of Hungarian banks, measured by the costs-to-income ratio, improved further, to 63 per cent excluding the MÉBIT transaction, from 65 per cent a year earlier. However, the costs-to-balance sheet total ratio stagnated at 3.7 per cent, which detracted from this generally positive picture somewhat.

Chart 2.27 **Ratio of interest and non-interest income to gross operating profits**



[25] Due to the change to the structure of data reporting, total fee income (i.e. that on financial and investment services) showed a much higher, 15 per cent, real rate of growth; however, the larger part of this stemmed from fee income on investment services having been treated differently in the past.

[26] Due to the different economic content of the transaction, the effect of the sale of MÉBIT has not been taken into account when calculating gross operating profits. Including the financial impact of the sale, the share of non-interest income would be higher.

[27] The release of provisions for country risk exposure has been adjusted with the estimated amount of additional value losses accounted for these assets.

[28] Around one-third of the total 1,600 reduction in workforce in 2001 H1 was accounted for by merging banks.

3 The position of non-bank financial intermediaries in 2001 H1[1]

Chart 3.1 **Distribution of household and corporate sector savings by intermediary institutions**

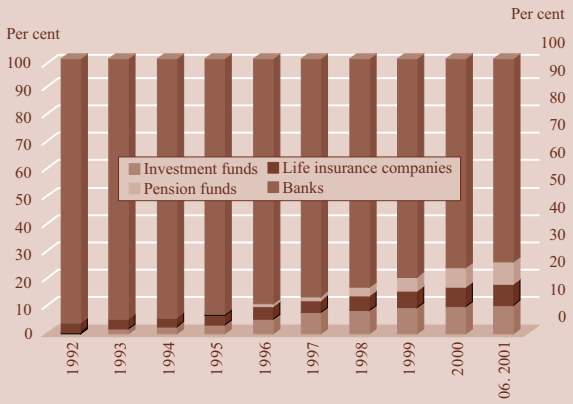
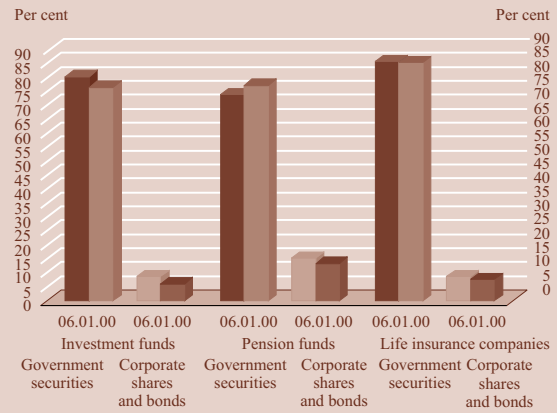


Chart 3.2 **Government securities, and corporate shares and bonds in institutional investors' portfolios**
(in per cent)



Three of the non-bank financial institutions which can be regarded as financial intermediaries, i.e. those channelling on the savings of households and businesses (investment funds, pension funds and life insurance companies), managed to increase their market shares within the financial intermediary system in 2001 H1. The combined share of these institutions within households' and businesses' savings placed in the entire financial sector rose from 24 per cent to 26 per cent in six months (see Chart 3.1). Savings held in pension funds grew the most strongly. This salient increase occurred despite the wave of mergers among pension funds – a dominant tendency for two years now. In terms of investment funds, those investing in bonds and money-market instruments registered growth in the market, with those focusing on equities and mixed assets losing a portion of their asset values due to stagnation in the equities market. Within life insurance, unit-linked insurance schemes could not sustain their earlier growth momentum, explained also by slack activity on the capital market.

In their conduct of investment policies, the three types of institutional investors moved from being rather conservative to being even more risk averse. Currently, the share of debt securities issued by the state and the NBH accounts for around 75–85 per cent of their portfolios. The ratio of corporate shares and bonds has fallen at all three types of institutional investors (see Chart 3.2).

The market of investment firms is undergoing a period of contraction and realignment. Independent institutions, i.e. those in non-bank ownership, are turning out increasingly worse results, and are being forced to exit the market. This, however, does not threaten, but rather reinforces, the stability of the financial institutional system.

Investment funds

Market size

Total assets managed by mutual investment funds amounted to HUF 606 billion at the end of June 2001, representing an increase of 7.6 per cent compared with HUF 568 billion at end-

[1] There have been a number of changes to the analysis of non-bank intermediaries relative to the previous issue of the Report on Financial Stability. The range of institutions analysed has been changed. In this issue, life insurers, investment firms (with a greater emphasis on those related to banks) and financial enterprises actually engaged in financial intermediation are being analysed, in addition to investment funds and pension funds. State-owned enterprises, such as Hitelgarancia Rt, Reorg Rt etc, which are engaged in specialised activities, have been omitted from the analysis. Since semi-annual data for financial enterprises are not available, they are not analysed in this Report.

December 2000. Flows into more secure money-market funds and bond funds accounted for the larger part of this increase, with all other types of funds suffering net value losses.

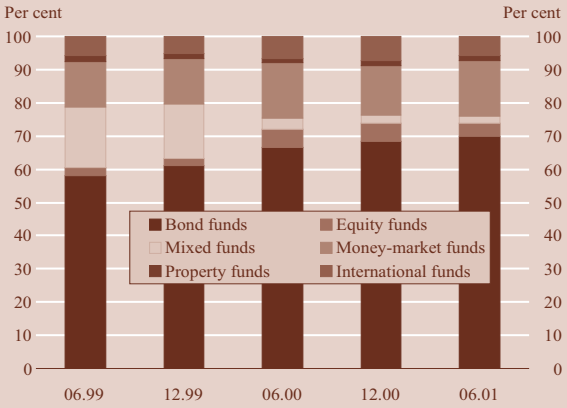
The number of open-end investment funds was 95 at the start of 2001 and 96 at end-June, with that of closed-end funds remaining at 3. Assets managed by investment funds continued to be more concentrated, as result of which the number of 'billionaires' rose to 44.

New varieties of open-end funds have appeared, thus helping those willing to invest to undertake market risks in a more sophisticated manner. Currently, buyers of investment units may choose from among funds investing in equities, mixed assets, money-market assets, real property and international financial assets, i.e. foreign shares and bonds (see Chart 3.3).

The basis for this categorisation is the type of fund, as recommended by the national organisation of investment funds (Bamosz). However, in some cases funds' portfolios vary from those suggested by the individual categories. At end-June 2001, 21 per cent of international funds' total investments were domestic assets, typically government bonds and NBH bills. Consequently, the labelling of an investment fund does not guarantee that it is exclusively engaged in the type of investment activity indicated by its name.

The massive declines in prices on the domestic and international equities markets were not beneficial for the net asset values of funds investing in stocks. Stock market distress and the withdrawal of capital both tapped equity funds' portfolios. Apart from minor interruptions, yields were on a downward trend in the government securities market, which raised the net asset value of funds investing in bonds. The loss of market share by mixed funds suggests investors' clear-cut expectations of changes in share and bond prices – they are more and more reluctant to trust professionals with making a choice between the two markets.

Chart 3.3 **Market shares of different types of investment funds**



Owners of investment fund managers

Most fund managers are owned by banks. Credit institutions are not represented in only a handful of fund managers. The market is dominated by managers with a background of majority (direct or indirect) bank ownership. They account for 96–98 per cent of the market in terms of total assets managed.

The strategy of banks dominating the market increasingly features the goal that a fund manager should supply the widest possible range of open-end funds, offering opportunities for investors to choose an investment unit which befits their appetite for taking risks. A number of investment funds, together with their parent banks, offer opportunities for investors to buy or sell investment units under favourable conditions from a current account (or a special investment account) maintained by the bank directly (in many instances over the phone), or to reallocate their savings among various funds.

The breakdown of investment unit holders by the major institutional sectors has not changed a great deal – households remain the dominant participants, purchasing more than 80 per cent of units. These accounted for 7.8 per cent of households' net financial wealth in December 2000 and 8.2 per cent at end-June 2001.

Table 3.A **Composition of investment funds' assets**

Per cent

	1999	2000	June 2001
Cash and bank accounts	1.1	1.5	0.7
Government securities, NBH paper	80.3	80.4	76.5
Bank deposits, bank securities	3.1	0.2	9.9
Shares	4.6	5.5	3.5
Bonds	4.6	3.2	2.6
Property	1.2	1.1	1.0
Investment abroad	4.1	7.2	5.5
Other	1.0	0.9	0.3
Total	**100.0**	**100.0**	**100.0**

The portfolio of investment funds

Domestic investments continue to dominate funds' portfolios – the share of foreign investments within the total portfolio was 9 per cent in June 2000, falling to only 6 per cent a year later.

The majority of domestic investments are comprised of low-risk assets, including government bonds, discount treasury bills and NBH bills. The share of these instruments in the total portfolio is around 80 per cent. Whereas at the end of 2000 H1 funds' government bond and NBH bill holdings were divided 50/50 between short and long-term instruments, at end-June 2001 funds held nearly three times as much short-dated as long-dated government paper. (Bank deposit holdings increased strongly towards end-June 2001, a transaction of one fund being in the background.)

The proportion of equities within the domestic portfolio continues to be low, due to the series of stock market shocks and poor performance of the domestic stock market (see Table 3.A).

Profitability and returns

Looking at profitability, investment funds shared the common feature of returning lower results than the benchmarks, i.e. the BUX, MAX and RAX, in the period under review. However, apart from a couple of exceptions, the volatility of returns was lower than the reference yield, so funds managed to make use of the advantages offered by diversification.

The profitability of funds by type showed a varied picture in 2001 H1. Domestic and international equity funds carry higher risks. Their net asset values fell significantly, and all but two of the international bond funds and mixed funds also posted negative results. Gainers in the period were clearly the domestic bond funds and money-market funds. Their returns were positive without exception, exceeding even deposit rates in some instances.

Insurance companies

Market size

The number of insurers operating as companies limited by shares fell by one to 22 in 2001 H1. The British giant CGNU, ranked the sixth largest insurance firm in the world based on insurance fee income, entered the Hungarian insurance market by taking over MÉBIT from ABN AMRO Rt.

The share of life insurance reserves as a percentage of households' financial savings continued to increase in the period under review, although the pace of this growth was less rapid than in the same period of the previous year. At end-June 2001, life insurance reserves accounted for 7.5 per cent of households' net financial assets, showing a 0.5-percentage-point increase relative to the beginning of the year.

The unit-linked insurance business, soaring since 1998, has been responsible for most of the robust increase in life insurance reserves in recent years. Towards the end of the first half, insurance reserves relating to unit-linked insurance policies accounted for 14.3 per cent of total life insurance reserves.

Insurers' life insurance activity

The continued shift observable within the two branches of the insurance business towards life insurance within insurers' insurance fee income, reflecting the western European developments,[2] stopped in 2001 H1. Looking at the percentage accounted for by the various types of fee income in the period under review, the share of fee income registered by the life insurance branch fell by 5.8 percentage points to 40.6 per cent relative to the end of the previous year. Behind this development was the massive drop in fees related to single premium contracts, most of which are unit-linked. The choice of life insurance linked to single premium investments represents an alternative to investment units as a form of saving. Unfavourable international capital market developments played an important role in the decline in fee income from these schemes; however, taxation rules and amendments of such (or changes in their interpretation) also appear to have an influence on the life cycle of these products.

Life insurance companies booked revenues of HUF 82.3 billion in life insurance fees in 2001 H1, which was 11 per cent lower in real terms than in the comparable period of the previous year. Fees surrendered to re-insurers accounted for 10.3 per cent of gross life insurance fee income, relating in full to foreign re-insurers. This was comparable with the ratio of maintaining risks seen in 2000 H1. Looking at the life insurance business, re-insuring life contracts does not carry an important risk factor for Hungarian insurance companies.

Mixed life insurance contracts contain elements of both risk-taking and saving. At 56 per cent, they continue to account for the largest part of life insurance fee income. Fee income related to these schemes suffered a 9 per cent decline relative to the same period of the previous year. Unit-linked insurance products may have been considered to be the mainstream product in the life insurance business in previous years, but they were less successful in the period under review, with fee income in this market segment falling by 18 per cent in real terms in comparison with the same period of 2000. Nevertheless, they continued to account for a 35 per cent share within total income of the life insurance branch.

The combined share in the life insurance market of the five insurance companies with the largest fee income fell by 1.7 percentage points relative to the end of 2000. But despite this fall, they still held 82 per cent of the total market at the end of the period under review, suggesting a continued high degree of concentration in the business. Currently, four insurers in the insurance market can be classified as related to domestic banking groups. These four companies provided 42 per cent of total fee income of the life insurance business in 2001 H1. All of them fully utilised the opportunities for cooperation between banks and insurers.

Investments by life insurers

Life insurers continue to pursue cautious, conservative investment policies. Looking at total insurance reserves, risk-free gov-

[2] Life insurance represented 61.4 per cent on average in the OECD countries in 1999 and 62.9 per cent in members of the European Union.

Table 3.B **Composition of life insurers' investments**

Per cent

	December 2000	June 2001
Cash and bank accounts	0.3	0.5
Government securities, NBH paper	85.9	85.5
Bank deposits, bank securities	2.1	1.4
Shares	6.4	5.2
Bonds	2.4	2.4
Other	2.9	5.1
Total	**100.0**	**100.0**

Table 3.C **Percentages of unit-linked and traditional life insurance reserves within insurers' investments**

	Unit-linked		Traditional	
	Dec. 2000	June 2001	Dec. 2000	June 2001
Cash and bank accounts	0.4	0.1	0.3	0.6
Government securities, NBH paper	68.1	73.3	91.0	88.5
Bank deposits, bank securities	0.6	0.1	2.5	1.7
Shares	26.9	21.4	0.5	1.2
Bonds	0.1	0.0	3.1	3.0
Investment units	3.7	4.9	0.4	1.8
Other	0.2	0.1	2.2	3.3
Total	**100.0**	**100.0**	**100.0**	**100.0**

ernment paper and NBH paper account for 86 per cent, while shares account for 5 per cent (see Table 3.B). These latter are considered the riskiest assets.

Under the new regulations which entered into force on 1 January 2001, insurers may invest their insurance technical reserves and solvency margins in securities issued in OECD countries and denominated in foreign currency. Insurance companies were quick to react to this change in the regulations – on 31 June 2001, they held 0.7 per cent of their life insurance reserves in securities issued in OECD countries and denominated in foreign currency.

Decomposing insurance reserve investments into unit-linked investments and traditional investments, insurers invest a relatively high, though falling, proportion of unit-linked reserves, unburdened by guaranteed returns and thus carrying only indirect risks for insurers, in equities (see Table 3.C).

Risks

Insurance companies' direct interest rate and exchange rate risks exist in relation to their choice to not realise the technical interest rate they have undertaken in respect of investing life insurance reserves.[3] However, this risk exposure is insignificant with current inflation rates, as the related Ministry of Finance Decree allows the use of a maximum 5.5 per cent technical interest rate.[4]

The amendment to the Insurance Act has been in force since 1 January 2001. Although this allows insurance companies to invest a part of their life insurance reserves in mortgage loans, the supervisory authority has not yet issued a licence to pursue mortgage lending activities, so insurers are not faced with lending risks.

At the same time, however, the largest domestic insurance companies have begun selling new life insurance products combined with housing loans under cooperation agreements with commercial banks, instead of engaging in mortgage lending provided at proprietary risks.

Pension funds

Market size

The sector's operations were dominated primarily by efforts to improve cost efficiency and economies of scale. After three years of operation, a stable segment in the private pension fund market appears to be developing in which membership increases only as new entrants on the job market appear. The number of Hungarian private pension funds did not change in 2001 H1, while the major motivating factor behind the change in respect of voluntary funds was the start of a wave of mergers. About half of private pension funds' founders are banks or insurance

[3] Insurers have a contractual obligation to deliver this return, but they may not promise a higher return in the contract than the statutory maximum. If insurers realise returns above the promised level on their investments of actuarial reserves, then they are obliged to refund a certain percentage (minimum 80 per cent) of the excess return to the insured.

[4] Reduction in the technical interest rate is currently underway, justified by the fall in inflation. However, this change will not affect the existing contracts.

companies, if one takes into account recent mergers. By contrast, the role of funds founded by employers among founders of voluntary pension funds has been much more significant since the early days of business.

The value of savings accumulated by fund members for pension purposes in the two types of funds amounted to HUF 467 billion at the end of 2001 H1, exceeding the value at the end of the same period of the previous year by 44 per cent in nominal terms and by 30 per cent in real terms. The increase amounted to 17 per cent relative to December 2000. The volume of financial assets managed by pension funds at end-June accounted for 7.7 per cent of households' gross financial wealth, in comparison with 6.8 per cent at the end of 2000. Membership fee revenues of voluntary and private pension funds amounted to HUF 68.6 billion in the first half, representing a 16 per cent increase relative to the same period of 2000 (see Table 3.D)

Table 3.D **Pension funds' key data**

	Voluntary pension funds			Private pension funds		
	30 June 2000	31. Dec. 2000	30 June 2001	30 June 2000	31. Dec. 2000	30 June 2001
Number of operating funds	125	117	123	25	25	25
Membership (thousands)	1,077.6	1,079.0	1,115.1	2,125.4	2,186.7	2,555.0
Assets (at book value, HUF billions)	189.9	224.0	246.6	135.0	175.6	220.8
Membership fee revenue (HUF billions)	20.9	47.5	23.5	38.2	62.3	45.1
Operating costs (HUF billions)	1.6	3.2	1.7	2.3	5.4	3.3
Returns credited to personal accounts (HUF billions)	8.0	13.7	5.1	4.1	7.3	3.1

Private pension funds

Of the 25 licensed private pension funds operating at the end of June 2001, 13 were backed by banks or insurance companies, 7 were employer-founded and another 5 were jointly founded, i.e. by a voluntary fund and/or several small employers.

The number of pension fund members was 2.6 million at the end of the period under review, rising by 16.8 per cent relative to end-2000. Funds raised HUF 45.1 billion in membership fees. This represented an increase of 18.1 per cent in volume terms and 7.7 per cent in real terms relative to 2000 H1. Net revenues of private pension funds from investment activities amounted to HUF 3.1 billion in 2001 H1, down 25.1 per cent on the same period of the previous year. Although they pursued conservative investment policies, pension funds were hit by the bearish sentiment in the equities market. Operating costs rose considerably, explained primarily by fees paid out to businesses providing services related to administration and registration. Membership fee revenues and net revenues related to investments were the two major contributors to the increase in funds' total wealth. At end-June 2001, funds' total wealth was 25.7 per cent higher than at the end of the previous year.

Funds' have pursued rather conservative investment policies over the past three years. This meant they generally did not fully utilise the portfolio investment limits set by regulations. Looking at the composition of private pension funds' portfolios, total assets held in government securities rose from 78 per cent at the end of 2000 to 79 per cent, with the proportion of equities remaining at 14 per cent recorded in December (see Table 3.E).

Table 3.E **Composition of private pension funds' assets**

Per cent

	30 June 2000	31. Dec. 2000	30 June 2001
Cash and bank accounts	0.9	1.1	0.9
Government securities, NBH paper	81.1	78.0	78.9
Bank deposits and securities	0.4	0.2	0.6
Shares	12.5	14.0	14.0
Bond	1.3	2.0	1.6
Investment abroad	2.8	0.7	0.6
Other (investment units, etc.)	1.0	4.0	3.4
Total	**100.0**	**100.0**	**100.0**

Voluntary pension funds

Voluntary pension funds have been operating in Hungary since 1994. The market appears to have reached its peak in 1996, and closures, mergers and foundations have been going on simultaneously since then. The increase in the total number of members slowed gradually in the period 1999–2001. Despite this

Table 3.F **Composition of voluntary pension funds' assets**

Per cent

	June 30 2000	31 Dec. 2000	30 June 2001
Cash and bank accounts	2.3	1.6	0.8
Bank deposits	6.5	2.8	2.1
Government securities, NBH paper	69.7	69.9	75.8
Shares	13.5	11.5	10.3
Bonds	1.1	3.1	3.3
Investment abroad	2.0	1.4	2.2
Other (investment units, properties, etc.)	4.9	9.7	5.5
Total	**100.0**	**100.0**	**100.0**

pause in recruiting new clients, membership fee revenue has been rising, as existing members have continued to step up their savings for long-term pension purposes. The number of funds with operating licences was 123 at the end of the first half, their membership exceeding 1.1 million.

Voluntary pension funds had membership fee revenues totalling HUF 23.5 billion in 2001 H1, representing an increase of 12.4 per cent relative to the same period of the previous year. Funds raised a total HUF 5.2 billion in net revenues from investment activities in the period under review. Operating costs amounted to HUF 1.7 billion, accounting for 7.5 per cent of membership fee revenues.

Total assets of voluntary pension funds rose by 10.1 per cent in six months. The composition of their portfolio changed similarly to that of private pension funds, with the exception that the proportion of government securities rose more strongly within voluntary pension funds' assets (see Table 3.6).

Risks

Holdings of equities account for around 10–14 per cent of the funds' portfolio. Nevertheless, the continued decline in share prices had a considerable impact on the value of their investments in the period. Funds do not actively manage their government securities holdings, which exposes them to significant interest rate risks. Consequently, net revenues from investment activities are at low levels, in addition to other factors affecting their performance. In the case of funds, market risk is equal to the investment risk of reserves, i.e. the total of individual accounts, which in turn is carried by the members. This fact does not affect the solvency of the funds.

The operational risks of the funds are relatively high, resulting mainly from the imperfections in their recording and computer systems. The primary risk factor from the perspective of pension funds' operations is the three-way relationship of funds, asset managers and custodians, which essentially means developing accurate recording methods, adequate and real-time flow of information and rules for procedures. Here, the process of choosing asset managers deserves special mention, with regard to risks and costs related to their operations in particular.

From 2001, funds are required to disclose their investment policies to members, which has contributed vastly to the transparency of funds' operations. Beginning from 1 January 2002, all private pension funds will be required to value their assets on a daily basis, in contrast with the current asset valuation exercise conducted on a quarterly basis. However, operating costs are expected to increase further as a consequence of the new regulation.

Changes to the related legal regulation which are currently being prepared represent a further source of risk for funds. Returns to the founders on investments, generally in the form of a subsidy at the time the funds were established, and developments in operating costs were based on the easy-to-forecast number of members.

The abolishment of compulsory entry by new job market entrants and of the standard guarantee requirement may lead to a decline in actual membership. This in turn is expected to cause

an increase in per capita operating costs, due to the high fixed costs of funds' operations. In addition, funds will likely step up their marketing activities in order to retain their members, which will be another factor adding to costs and will retard growth in savings actually devoted to long-term pension purposes.

Investment firms

Market size

The decline in turnover on the Budapest Stock Exchange which began in 2000 Q1 continued in 2001 H1. Demand for exchange-traded shares fell further, with important foreign and domestic investors withdrawing from the Hungarian share market in the period under review. The BUX lost around 17 per cent of its value in 2001 H1. The further shrinkage of the market and the narrowing of market opportunities forced investment firms to rationalise business, or, as a last resort, to quit the market and wind up their operations.

Just 39 investment firms were actually in operation at the end of the first half (44 had operating licences at the end of the period, but 5 had suspended their operations in the meantime, see Table 3.7). Of the 39 investment firms, 4 were operating as commission brokers, 18 as securities traders and 17 as investment companies.

The supervisory authority gave permission to one investment firm from among those associated with banks to merge into the parent company. Based on notifications by a number of parent banks to the authority about their intentions, the current pace of mergers will likely pick up in the second half of the year.

Fewer and fewer independent investment firms are able to stay afloat under the prevailing unfavourable market conditions. A number of companies have already decided to withdraw from the market, while others have been making a concentrated effort to push forward by buying up the customers of those pulling out of the market. Faced with a dramatic fall in market turnover, the firms are undergoing a process of realignment and concentration, while at the same time tailoring their business to the size of the market. This is believed to strengthen the sector's stability, as only those firms will be able to continue business that are able to flexibly adapt to the changing environment.

The recent shift in the number of firms towards those owned by banks and insurers provides a more solid financial background for business. This is seen as a positive sign from the perspective of risks, as in this way the sector's stability and resilience is reinforced. Despite the increase in the proportion of investment firms associated with financial institutions, their number has been falling continuously. And although an enterprise may be wound up, this does not necessarily mean the operations are closed down, as the universal parent bank may continue to provide investment services.

The aggregate balance sheet total of investment firms associated with banks or insurance companies accounted for 86.4 per cent of the balance sheet total of all investment firms on 30 June 2001 (see Table 3.8). According to their balance sheet totals, the eight largest firms are associated with banks or insurers, and account for 69 per cent of the aggregate balance sheet total. This

Table 3.G **Number of operating investment firms**

Number

	31 Dec. 1999	30 June 2000	31 Dec. 2000	30 June 2001
Associated with financial institution	26	21	20	18
Independent	39	34	28	21
Total	65	55	48	39

Table 3.H **Balance sheet totals of investment firms**

	HUF billions				Index (%)	
	31 Dec. 1999	30 June 2000	31 Dec. 2000	30 June 2001	June 2001/ June 2000	June 2001/ Dec. 2000
Associated with financial institution	123.4	120.6	146.2	133.1	110.3	91.0
Independent	38.9	32.9	29.4	21.0	64.0	71.6
Total	162.3	153.5	175.6	154.1	100.4	87.8

shows the importance of investment firms owned by financial institutions. Based on its balance sheet total, the largest independent firm ranks 9th on the list of investment firms.

Two brokers, closing down their operations in the period, assigned their customer bases to the parent bank and another securities broker. This played a less significant role in the fall in the balance sheet total of investment firms associated with financial institutions. Those firms that were about to merge into the parent company have scaled back their activities in the market or had already begun ceding their customer bases to the parent, which played a much more significant role in the fall.

Capitalisation[5]

Total shareholders' equity of investment firms associated with financial institutions did not change substantially in 2001 H1 relative to the end of the previous year. However, 5 out of the 18 companies had lower shareholders' equity than their registered share capital. The parents of two of those five firms have already decided to merge them into their own organisation. Moreover, the customer base of one firm has already been assigned from the firm to the parent. The parent of the third firm with foreign ownership has announced relocation of its Hungarian investment business to one of its foreign subsidiary companies. The parents of the remaining two investment firms are expected to make steps in order for the merger to take place.

Capitalisation of investment firms associated with banks or insurers is still seen as favourable, shareholders' equity being 76 per cent higher than registered share capital. By contrast, independent investment firms' shareholders' equity is only 19 per cent higher than their registered share capital.

Profitability

The sector's profitability fell markedly in the period under review. Profits before taxation did not nearly reach the level of HUF 4.7 billion recorded in the same period of the previous year, coming in at just HUF 1.4 billion. Pre-tax profits of investment firms associated with banks or insurers dropped less strongly than those of the entire sector, accounting for nearly 50 per cent of profits realised in 2000 H1. Profits were down drastically despite investment firms having significantly cut their operating costs.

In spite of the efforts to improve cost control throughout the entire sector, cost efficiency deteriorated further in the period. Operating costs mopped up 82 per cent of firms' ordinary profits in 2001 H1, as compared with 74 per cent a year earlier. The costs of IT developments due to the introduction of the trading book in April 2001 probably played a role in this. Cost efficiency of investment firms associated with banks or insurers deteriorated only slightly in the first half, and was much more favourable in comparison with the sector as a whole.

[5] Investment firms are required to keep trading books from 1 April 2001 and to accumulate capital based on this, taking into account risks actually undertaken. However, no information is available about investment firms' trading books as yet, which makes the analysis of capital strength incomplete.

Risks

Large-scale realignment is currently underway in the sector of investment firms. During this process, those firms that have proved unable to adapt to the changing, worse market conditions are now being forced to pull out of the market, leaving room for better capitalised firms that are able to adjust their businesses more flexibly. This process is likely to improve the sector's stability.

A total HUF 500 million loss of capital due to the decline in profitability affected only five from among investment firms associated with banks or insurers. This is an insignificant amount if one compares it with their combined registered share capital of HUF 23.5 billion. The losses incurred do not seem to jeopardise either the parents' or the sector's stability.

The profitability of independent investment firms decreased dramatically, simultaneously with the decline in business, their capabilities to accumulate capital weakening significantly. It is expected due to the losses incurred that owners will vote to close down the operations of a number of firms. However, these firms are unable to influence the risk exposures of the Hungarian financial intermediary system as a whole.

4 Articles

Stress Testing

by Marianna Endrész-Valentinyi

The results of stress tests were first published in the February 2001 issue of the Report on Financial Stability. The purpose of running the tests was to quantify the effects of exceptional market and credit events on the value of domestic banks' portfolios. Adopting the methodology presented in detail in the original article, we have carried out the calculations again, this time using data for end-December 2000. Once more, the analysis covered the entire range of Hungarian banks, excluding non-bank financial intermediaries (which may have special importance in the case of estimating market risks). When quantifying the impact of various market and credit shocks, we followed the methodology presented in the original article.[1] As a reminder, we estimate the impact of changes in interest rates using duration factors, and the impact of credit shocks using the change in non-performing loans and the required risk provisioning against those loans. The calculated losses are always expressed as a percentage of core capital, as our aim is to find out whether there is adequate capital available for banks to cover such losses.

The purpose of the first investigation was to reproduce the tests conducted within the FSAP (Financial Sector Assessment Program), but this time using individual data. The IMF and World Bank team only had access to data aggregated on banking groups, which was expected to underestimate the impact of shocks. Indeed, our calculations, based on individual data, resulted in higher losses for the same scenarios.

This time we would like to further refine the choice of scenarios. We are going to analyse a number of hypothetical scenarios, in addition to historical scenarios, and to conduct sensitivity analyses on the individual market risk factors. In contrast with the previous study, when we analysed only one-way moves (increase in market rates, depreciation of the domestic currency), this time we also quantify the effects of changes in the opposite direction. We do not question that shocks generally cover the events noted above (interest rates rarely experience sudden decline of several percentage points, or currencies a significant appreciation).[2] Conceivably, though, the banks' portfolios might respond sensitively just to the changes noted above. Nevertheless, it requires thorough consideration to determine the size of shocks (degree of market interest rate falls or forint appreciation) that are realistic and relevant in the case of the Hungarian economy.

In addition to increasing the number of scenarios, we have made one major change to the methodology employed. The first tests assumed a hypothetical portfolio, in which only interest rate risks were calculated for 'bonds' and only credit risk for loans. Now the approach will be modified to include loans in interest rate risk calculations as well, i.e. both credit and market risks will be calculated for them. This will lead to an overestimation of the overall risk, but it will provide a more reliable picture of market risk – removing loans from the calculations would lead to an underestimation of interest rate risk. In principle, there are arguments in favour of both approaches. As long as market and credit risk can be considered as independent , the above 'duplication' is acceptable (i.e. that both interest rate and credit risks are calculated). During financial crises, however, these two types of risk may become strongly correlated. This may be a counterargument against the change to methodology. However, a supporting argument is that the losses caused by interest rate shocks are realised more rapidly than the effects of deterioration in loan quality following a market shock, and the fact that we obtain a more accurate estimate of market risk.

As it was emphasised in the conclusion of the earlier study, instead of the absolute losses, we should focus our attention primarily on the direction of changes and the concentration of losses. Therefore, it is important for the successive analyses to be comparable. We are only able to compare the results of the two analyses (i.e. those undertaken for 1999 and 2000) in terms of the entire banking sector and identical scenarios. The practical consequence of this is that certain calculations on 1999 data have to be rerun using the new scenarios and the above methodological change as well as omitting wound-up banks from the analysis. The results by banking groups are not comparable either, because the banks' robust growth and improving profitability have caused a massive realignment in the

[1] For this reason, we will discuss methodological issues only to the extent that they are required for understanding.

[2] The events of the recent past provide examples for this. Significant widening of the forint's intervention band has led to an almost 10 per cent appreciation over a short period. Measures taken following the terrorist attacks on the United States can be mentioned as examples of substantial interest rate cuts.

groups used earlier. In case of correlated tests the differences in the underlying correlation structures make it difficult to compare the results.

No satisfactory results have yet been achieved in modelling credit risk by macro variables; therefore, the correlated tests have only been conducted for market risks and not for credit risk.

Data, scenarios

Market risk calculations are based on the maturity distribution of individual banks' portfolio (all interest sensitive on and off-balance-sheet items are put in maturity buckets according to their remaining time to maturity or first re-pricing, then their net value is taken within each bucket). Table 1.A shows the composition of the aggregate portfolio denominated in either domestic or foreign currency.

In order to estimate the effect of a credit shock, we use the data on the classified lending portfolio. In addition to the proportion of non-performing loans (NPL), Table 1.B. also includes other data that we use to define the various scenarios. Non-performing loans are comprised of assets qualifying as bad and doubtful. Risk-free assets, in turn, include banks' claims vis-à-vis the government and the central bank.

The tables also include data for end-1999. We will rely on these when evaluating the results.

The discount factors, required for the calculation of net present values, are based on the relevant points of the domestic and German benchmark yield curve in December 2000. As to duration factors, the 'assumed durations' recommended by the BIS will be used (see Table 1.C).

Two historical scenarios are provided for estimating market risks, where individual shocks are defined as the largest change in the various risk factors observed over a month. The scenarios obtained in this way are summarised in Table 1.D.

Table 1.A **The interest sensitive portfolio of Hungarian banks at 31 December 2000** (HUF millions)

HUF millions

	0–30 days	30–90 days	90 days–1 year	1–2 years	Over 2 years
Forint, 1999	–1.021.514	289.729	418.089	97.531	108.348
Forint, 2000	–615.703	383.308	196.822	64.606	189.375
Change	60.3%	132.3%	47.1%	66.2%	174.8%
FX, 1999	–314.096	29.108	39.410	89.673	130.452
FX, 2000	–175.333	105.860	8.675	100.890	49.375
Change	55.8%	363.7%	22.0%	112.5%	37.8%

Table 1.B **Some characteristics of the asset portfolio**

	Share of NPL (per cent)	Risk-free assets (per cent)	Standard deviation of NPL (HUF millions)	
			1994–2000	1995–2000
1999	2.74%	21.10%	70.243	52.433
2000	1.89%	18.20%	60.349	47.438

Table 1.C **Discount and duration factors**

	0–30 days	31–90 days	91–365 days	1–2 years	Over 2 years
Discount factor					
Domestic assets	0.9908	0.9727	0.8968	0.8108	0.7391
Foreign assets	0.996	0.988	0.9543	0.9131	0.8726
Duration	0	0.2	0.55	1.25	2.5

Table 1.D **Historical scenarios based on the maximum changes in risk factors**

	Sce-nario 1	Sce-nario 1	Period
Domestic interest rate			
One-month interbank (daily)	5.60%		Jan.1993–Dec. 2000
Three-month DTB (monthly average)		5.0%	Jan.1992–Dec. 2000
Foreign interest rate			
One-month DM LIBOR (daily)	1.88%		Oct. 1990.–Dec. 2000
Three-month DM LIBOR (monthly average)		0.65%	Jan.1990–Dec. 2000
Exchange rate			
HUF/DM (daily)	16.7%		Jan.1995–Dec. 2000
HUF/DM (monthly average)		12.0%	Jan.1990–Dec. 2000

The calculations have to be rerun for 1999 data as well, in order to be able to analyse the effects of extreme events over time.

In addition, we make calculations for hypothetical scenarios as well, within the intervals shown below:

– exchange rate [–30, 50],
– domestic interest rate [–10, 40],
– foreign interest rate [–4, 5].

Exchange rate changes are provided in per cent and those in interest rates are in percentage points.

The lower bound of changes in market interest rates is limited by the current level of interest rates. We are aware that these values are unrealistic (given that it is unlikely for foreign interest rates, for example, to fall by more than 1–2 per cent within a short period of time). Nevertheless, the rather wide intervals make it easier to see the difference between the effects of interest rate falls and rises.[3] The given upper values are based on the calculations of the National Bank of Austria.[4] The study referred to calculates the maximum changes in risk-free interest rates of a few countries for different intervals (including, for example, the period between January 1987 and December 1998) using several methods. We give the maximum values of changes in foreign interest rates based on the experiences of developed countries and those of domestic interest rates based on the experiences of emerging economies.

Typically, interest rates fall together with the inflation rate. Although this is rather the sign of a successful stabilisation programme than that of a crisis (and therefore it is likely to be built into the expectations, and banks will be able to adjust their portfolios accordingly), it might cause serious losses for banks.[5] Interest rates may also fall under circumstances when central banks are trying to offset the

[3] This argument holds true for the exchange rate as well.
[4] Oesterreichische Nationalbank: Stress Testing, in Guidelines on Market Risk, Volume 5, www.oenb.at.
[5] It is obvious when changes in interest rates are not anticipated. However even when they are, and banks consciously adjust their interest rate exposure they might be restricted to do so (for example, because of the relative underdevelopment of derivatives markets or because of high adjustment costs).

effects of a loss of confidence caused by a catastrophic event (for example, the terrorist attacks against the United States on 11 September 2001). In this case, it remains to be answered to what extent market rates will follow movements in the benchmark rate.

We have provided the upper limit to the potential depreciation of the domestic currency taking into account the calculations of the study already mentioned. The currency may experience a considerable appreciation, if, for example, the central bank changes the exchange rate regime or important liberalisation measures are taken. In Hungary, the forint appreciated by nearly 10 per cent following the authorities' move to widen the intervention band.[6] A one-off event, similar to the above, is not expected to occur in the near future. However, the events of the most recent past also provide examples (though different in nature) for exchange rate appreciation, which may reoccur more easily. Episodes of loss of investor confidence in emerging markets (the latest such event taking place due to the Argentine crisis) may affect Hungary as well, even if the economic fundamentals are strong. However, the depreciation of the currency following the withdrawal of capital may be reversed once confidence is restored.

In the case of credit risks, we analyse the effects of four events. First, we measure the potential effect of a shift in the asset portfolio. We suppose that the holdings of risk-free government securities and central bank assets fall by one-half and, simultaneously, outstanding loans increase by the same amount, while the quality of loan portfolio remains unchanged (i.e. the share of NPL does not change). We used this hypothetical scenario in the original study, and similar developments have commenced in the period since then. Simultaneously with the fall in the percentage share of government securities and central bank assets, there has been a significant increase in the proportion accounted for by loans to households and the corporate sector.

Scenarios 2 and 3 assume that the stock of non-performing loans increases by two standard deviations, while total loans remain unchanged. We give two estimates of the standard deviation based on the portfolio classification for the period 1994–2000 and 1995–2000 respectively. The first estimate renders higher values, as this still includes the bad asset portfolios for the period before consolidation.[7]

Finally, as a fourth case we will analyse the extent of provisioning that would be required if the stock of non-performing loans doubled.

[6] It can be seen from the developments in open positions that banks, too, had speculated on a massive appreciation.

[7] These three scenarios are identical to those analysed in the first stress test.

[8] When aggregating the data, we take into account only the losses. As a consequence, although for each bank the FX loss is the sum of losses caused by interest rate and exchange rate changes by definition, the aggregate FX loss may be lower than the sum of aggregate loss due to changes in interest rates and exchange rates.

[9] Open position is defined on a gross basis. We, however, calculate the effect of exchange rate movements for the net foreign exchange positions. The two do not necessarily move in the same direction, but in Hungary an increase in the former is usually associated with an increase in short foreign exchange position.

Evaluation of results

Market risks

Historical scenarios

According to the results of the uncorrelated stress tests using the historical scenarios, the loss caused by an increase in domestic interest rates has remained unchanged since 1999. This accounts for only 5.3 per cent and 4.7 per cent of the banking sector's core capital. However, the degree of concentration of losses due to domestic interest rate changes, which is the highest among all risk types, has increased. The main reason for this was the further increase in the percentage share of the bank suffering the largest loss (from 29 per cent to 39 per cent) (see Table 1.E).

The impact of an increase in foreign interest rates and the simultaneous depreciation of the domestic currency would be lower in comparison with 1999, with loss making up 1.5 per cent and 2.3 per cent of the banking sector's core capital. The primary source of losses is the depreciation, the effect of interest rate movements being virtually insignificant.[8] However, the concentration of these losses increased considerably relative to the previous year (see Chart 1.1).

It should be added to the above assessment that banks closed their open FX positions towards the end of the year. Consequently, the end of year snapshot is not representative and likely to underestimate the effect of forex shock.[9]

Table 1.E **Losses caused by market shocks as a percentage of core capital; uncorrelated stress tests**

Per cent

		2000	1999
Domestic interest rate	Scenario 1	–5.3	–6.4
	Scenario 2	–4.7	–5.7
Forex	Scenario 1	–2.3	–4.6
	Scenario 2	–1.5	–2.9
Foreign interest rate	Scenario 1	–0.8	–1.5
	Scenario 2	–0.3	–0.5
Exchange rate	Scenario 1	–1.8	–3.2
	Scenario 2	–1.3	–2.4

Chart 1.1 **Concentration of losses at end-1999 and end-2000 – market risk; uncorrelated tests**

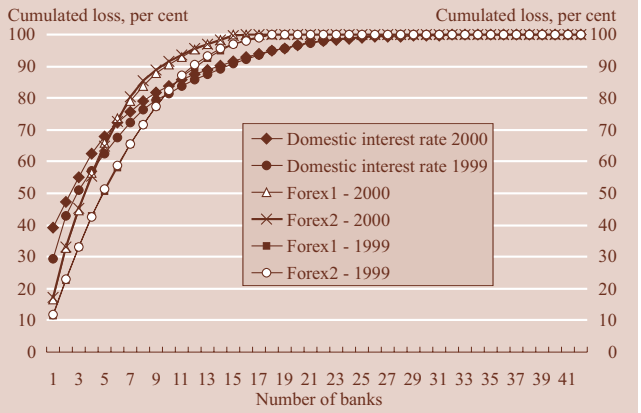
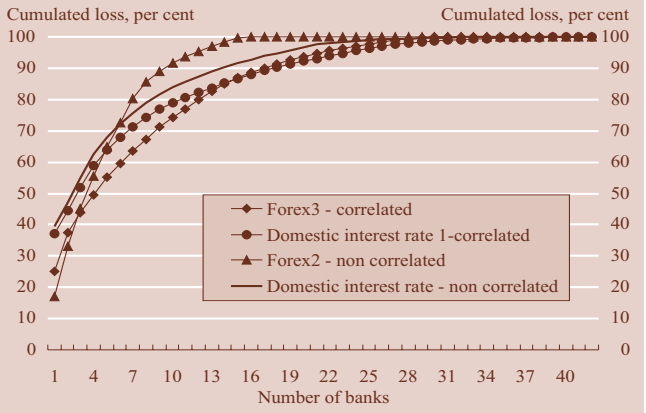


Table 1.F **Market risks (1 percentile, as a percentage of core capital; correlated stress tests**

Per cent

	Domestic interest rate	Foreign interest rate and exchange rate
Scenario 1	–1.9	–1.4
Scenario 2	–1.2	–1.0
Scenario 3	–3.1	–2.7

Chart 1.2 **Concentration of losses at end-2000 – market risk**



Looking at the data of individual banks, it can be seen that market shocks would not cause any significant losses even at the individual bank level. The number of banks that would suffer the largest losses (between 30%–50%) has dropped to 2 (see Table 1.F).

We have also conducted correlated stress tests for market risks, following the methodology presented in the original article. Using the Monte Carlo simulation, we have generated 10,000 innovations for the individual market risk factors, with given covariance structures. We give three estimates of the covariance matrices. In the case of the first two, we have estimated the standard deviations and correlation coefficients based on the time series for the periods 1998–2000 and 1994–2000 respectively. In the third case, we have chosen the largest standard deviation and correlation coefficient observed over certain time intervals. The third is the only 'scenario' which can be regarded as 'extreme event', as the first two are based on historical estimations. By contrast, the third is based on extreme values of variance and correlation. The results appear to reflect this as well – the computed (1 per cent) VAR-type measures are the highest in scenario 3. Multiplying the losses by three, analogously with the multipliers to be used when capital requirements are calculated on the basis of VAR, the magnitude of losses is broadly equal to those obtained by the uncorrelated tests (except in the third scenario).

Correlated losses show lower degree of concentration for both domestic interest rate and FX risk than in the case of uncorrelated tests. Chart 1.2 does not show all scenarios, but only those scenarios which yield the highest concentration.

Sensitivity analysis and hypothetical scenarios

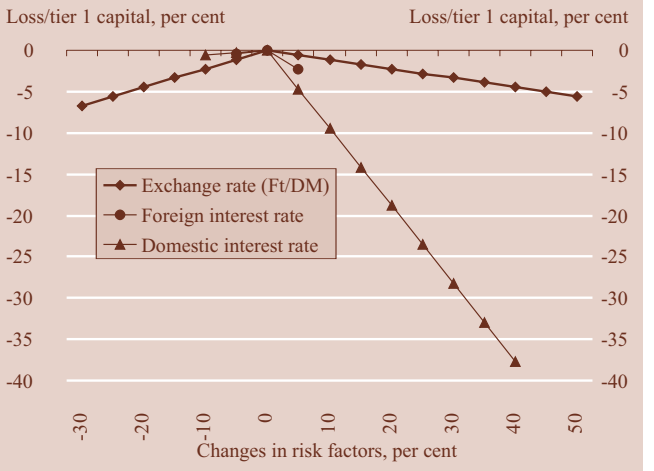
We have also conducted sensitivity analysis for the various factors of risk. First, we wished to find out the likely effect of a 'reverse' change, less related to a crisis, in interest rates and exchange rates, i.e. a fall in interest rates and an appreciation of the domestic currency. Second, we also wanted to find out which of the market risk factors would cause larger loss, and what the probable limits of these losses would be.

As Chart 1.3 shows, negative changes in risk factors, not analysed previously, would cause significant loss only in the case of the exchange rate. Moreover, here the loss would exceed that caused by a shock, equal in size, but having a positive sign. However, the negative changes that can be conceived realistically are of a much smaller magnitude than the positive changes.[10] They are even smaller than those presented in the Chart, therefore, given the current portfolios, the losses are not likely to exceed –5 per cent. Potentially large loss may arise from positive changes in risk factors, i.e. from a jump in interest rates and depreciation of the currency. In spite of this, it is useful to estimate the effect of negative changes as well, as the picture may change with the shift in the composition of banks' portfolios.

Focusing our attention on the right-hand side of Chart 1.3, it can be seen that the loss is most sensitive to changes in domestic interest rates. By contrast, the effect of foreign interest rates changes, the degree of which, moreover, may be much smaller due to the much lower interest rate level, is insignificant.

Throughout our analysis so far we have summarised only losses, which is regarded to be relevant from the perspective of systemic risks. However Chart 1.4 shows the net effect of changes, i.e. the balance of gains and losses suffered by banks. Analysis of the net effect may contribute to the evaluation of results. If, for example, two shocks

Chart 1.3 **Sensitivity analysis (end of 2000 data)**



[10] Also the likelihood of such events occurring is much smaller.

cause the same aggregate loss, but the net effect of the first one is positive (as this is the case with a decrease in interest rates and a depreciation of the currency) and that of the other is negative, then the assessment of risks is more favourable in the former case. Because large losses at certain banks are offset by large profits at others, the risk of contagion is smaller.

Analysing the combined effects of changes in foreign interest rate and the exchange rate (see Chart 1.5) provides a more realistic picture than that provided by the sensitivity analysis. Two statements can be made on the basis of Chart 1.4. First, the results reinforce the previous findings that an appreciation of the currency, independently of the movements in interest rates, tends to cause larger losses than devaluation. Second, while sensitivity analysis found positive correlation between the loss and the absolute value of interest and exchange rate changes, here this only holds for exchange rate. An increase in interest rates adds to, and a fall reduces, the total FX loss. However, the loss does not exceed 9 per cent even in the worst-case scenario, which has a very low likelihood of occurring. This confirms the results of the historical tests, i.e. it indicates low FX risk.

***Chart 1.4* Sensitivity analysis** (gains and losses)

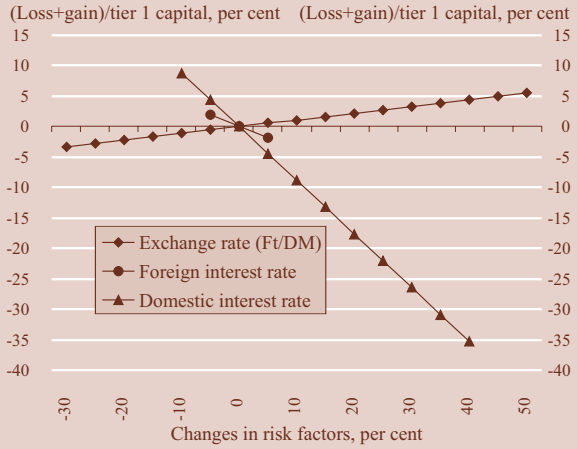
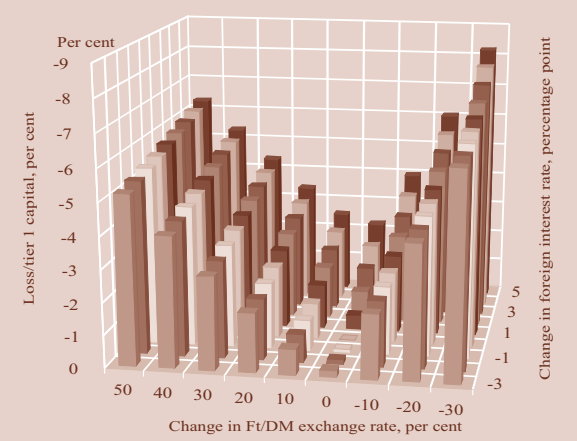


***Chart 1.5* FX risks – hypothetical scenarios** (at end-2000)



Credit risks

Whereas losses caused by market shocks are insignificant, deterioration in banking portfolios would cause much larger losses. Scenario 2 (the increase in NPL by two standard deviations), yielding the largest loss, would wipe out 30 per cent of the banking sector's core capital. For five banks the losses would exceed their core capital. Taken collectively, these account for 72 per cent of total losses and makes up 22 per cent of the banking sector' core capital. The range of the most badly effected banks did not change since 1999, however 3 out of the 5 have become profitable since.

***Table 1.G* Losses caused by credit shocks, as a percentage of core capital – uncorrelated stress tests**

Per cent

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2000	6.0	29.6	24.5	17.0
1999	10.8	41.9	33.6	27.7
1999*	10.8	39.3	32.5	27.7

* Using standard deviations for 2000.

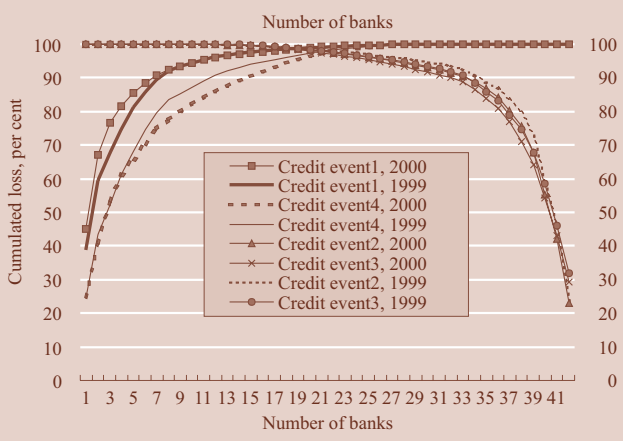
The computed losses show a significant reduction relative to 1999. This may be attributable mainly to the strong, 30 per cent increase in core capital within a year (see Table 1.G).

In scenario 1, both the fall in the share of risk-free investment (from 21.1 per cent to 18.2 per cent) and the improving quality of the loan portfolio (as evidenced by the drop in NPL/total loans from 2.7 per cent to 1.9 percent) contributed to the reduction in losses.

Scenarios 2 and 3 (the increase in NPL by two standard deviations) also would cause smaller losses in 2000 than in 1999. The difference between the two calculations is significant even if we take into account that the standard deviations used to define the scenario have decreased (see the last two rows of the Table 1.G).

The concentration of losses has not changed substantially (see Chart 1.6). Scenario 1 provides the exception, where the increase in the degree of concentration is closely related to the increase in the concentration of

***Chart 1.6* Concentration of losses – credit risk; uncorrelated tests**



risk-free investments. The high degree of concentration is a warning sign even when losses are small – this holds true in respect of market risks. In the case of credit risks losses are much larger, therefore the high degree of concentration makes the assessment of the impact of credit shocks even worse.

Conclusion

The analyses undertaken using data for end-2000 reinforce the findings of our first article on stress testing. The potential effects of market shocks continue to be very low. This statement is not only valid for the historical scenarios but for the more extreme, hypothetical scenarios as well. With the given portfolio of banks, an increase in domestic interest rates carries the potentially highest source of loss. This stems in part from the fact that the sensitivity of losses is the highest to domestic interest rates. Moreover the magnitude of possible changes in domestic interest rates is also larger than that in foreign interest rates. However, in the given macroeconomic environment there is little likelihood of such a scenario materialising.

Even the most extreme changes in foreign interest rates and the exchange rate would cause insignificant losses to the banking sector. However, analysis of consolidated data of banking groups would be required to be able to arrive at a more precise evaluation of exposures to exchange rate shocks.

Extreme credit shocks may cause significant losses to the domestic banking sector. However, the low leverage of Hungarian companies reduces the chances of such an event occurring. The presence of well-capitalised and committed foreign owners in the banking sector also lowers the likelihood of such shocks becoming a systemic threat.

Exposures have fallen relative to the result of the tests conducted with 1999 data in every risk category, the fall being most significant in case of credit risk. However, the concentration of losses has either increased or remained unchanged.

Liquidity management in VIBER (RTGS)

by Anna Morvay

A payment system operates adequately if one can all but ignore its existence. Experience suggests that payment systems rarely face severe malfunction. Nevertheless, the few and primarily foreign examples of trouble serve as a warning that payment systems, which facilitate interbank funds transfers without the involvement of cash, can turn into a medium of crisis posing a major threat to financial stability.

From the second half of the 1980s, central banks have become increasingly aware of this threat, which finally led to the world-wide spread of real time gross settlement (RTGS) systems. These RTGS systems, replacing netting systems, set higher requirements for their participants in respect of intraday liquidity management (payment orders are not carried out unless there are sufficient funds available). This is in contrast with the rules and procedures applied by netting systems (where the liquidity requirement has to be fulfilled by the end of the day).

These changes have also been felt in Hungary, but due to our different starting point, we have taken a slightly different course. In the early 1990s, when there was no uniform payment system in Hungary, banks maintained accounts at the National Bank. This solution involved a netting arrangement for certain banks, with settlement occurring two days afterwards (the liquidity shortfall, which appeared only subsequently, being met by a central bank credit). For other banks this involved a gross system where continuous liquidity had to be maintained on a county by county basis; moreover they were not allowed to use reserve requirements to meet this obligation. During this period the "Gironet" project was underway, with the aim to provide a real-time net settlement system that is unprotected by limits. Also during this time, an increasing number of banks lost their footing, some of them even experiencing serious instances of financial fraud. Bankruptcies may have led to grimmer consequences had the interbank giro system already been in operation. This threw light on the Gironet project's limited feasibility, namely that under the changed circumstances such a system could have only functioned with open or acquiescent guarantees from the central bank. Thus, the Gironet project was abandoned, because it became clear that it could not be reformed to suit the changed requirements.

The Interbank Giro system, (now called Interbank Clearing System or "ICS"), which has been operating during the early morning hours since 1994, together with the paper-based accounting system of the National Bank during the morning hours, represented a satisfactory combination in respect of credit risk, but failed to control liquidity risk effectively. The fact that monetary policy imposed rather high reserve requirements on commercial banks resulted in a lower risk to liquidity. The narrow-band crawling peg regime and administrative restrictions on short-term international capital flows brought about stable and predictable financial markets, where interbank payment turnover was kept at a permanently and relatively low level.

By establishing the VIBER system, the National Bank of Hungary did not only aim at modernising its settlement accounts service. Its primary motivation was the recognition that the liquidity risk should be lowered, as the coexistence of a relatively high level of required reserves and a relatively low level of payment flows would not last forever. The liquidity risk cannot be reduced unless the participants of the system are sufficiently well-informed about their positions at any given moment and they can also control their intraday liquidity positions so that their payment obligations will be met and they can close the day with the desired liquidity position.

In addition to a payment system's design and the applicable rules, the factors ensuring smooth operation include the participants' rational behaviour, the observance of rules and the utilisation of the system's capabilities. VIBER provides participants with real-time access to information about payment flows, current liquidity positions and incoming payments, and enables them to modify payment orders already entered and their liquidity positions. A centrally located queuing mechanism and an algorithm automatically processing a gridlock facilitate the management of payment flows. The banks are partly interested in maintaining as low account balances as possible relative to requirements, which must be brought in line with the liquidity needs (minimising queues) at any point in time.

First test of VIBER

VIBER was launched in 1999 amidst favourable liquidity conditions. Thus, participants of the system were not forced to immediately overhaul their intraday liquidity management regimes. This changed somewhat from 1 July 2000, when customers' payment transactions were introduced on a compulsory basis and banks had to ensure that the system would carry out customers' instructions within two hours.

However, the real change came in 2001. In the wake of the lowering of the reserve requirement ratio, the widening of the forint's exchange rate band and foreign exchange liberalisation, the pattern of payment flows altered. Banks experienced a jump in the value of payment turnover from non-resident bank customers, involving large-value individual transfer orders.

Chart 2.1 shows the increase in payment flows during the months of May to August, with customers' transfers and total payments plotted together (the right-hand and left-hand scales are not identical as the two types of data are of different orders of magnitude). It is clear from the graph that the high rate of payment flows stabilised in the final week of June. During that week the value of funds transfers

***Chart 2.1* Total payment flows in VIBER, including the value of payment orders initiated by customers May–August 2001**

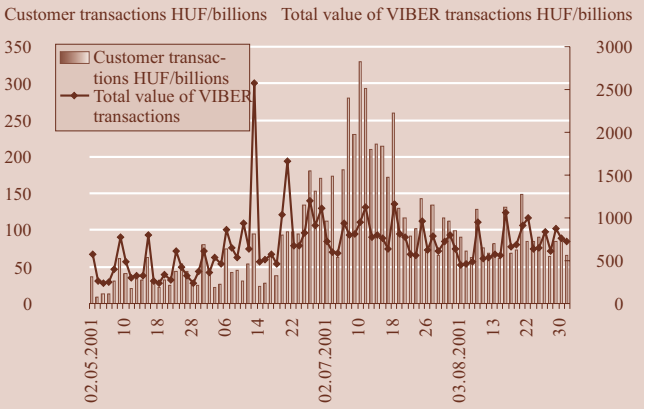


***Chart 2.2* Value of queued payment orders in VIBER by type**

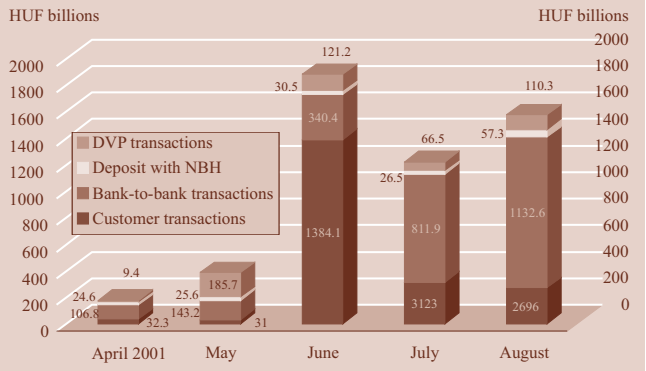
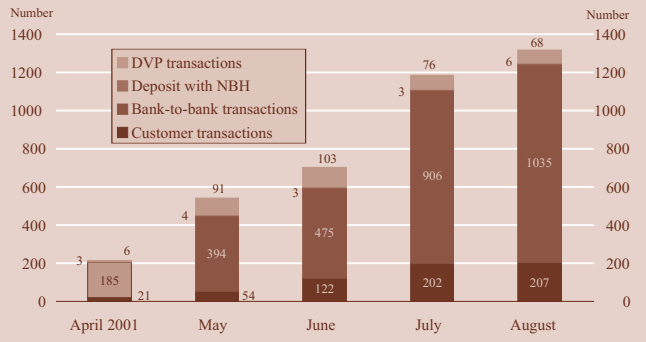


***Chart 2.3* Number of queued payment orders in VIBER by type**



initiated by customers consistently exceeded HUF 90 billion, relative to its previous fluctuation in the range of HUF 20 to 40 billion. July saw another increase in customer-initiated settlements, with its value exceeding HUF 300 billion on some days, returning to a daily average of HUF 80–90 billion in August. However, the total of settlements was more balanced and less volatile.

In January 2001, daily average payment flows (through the ICS and National Bank combined) amounted to 0.7 times the value of account balances available for banks at the start of a business day, in other words, the cover rate (debit orders/available covering balances) was favourable in terms of a smooth flow of payments (since a value under 1.0 means that each funds transfer is settled even if on a given day the bank does not receive a single incoming transfer). By June, this ratio had risen to 1.0, moving across the range of 0.5 and 15.5. Average monthly debit transfers for individual banks amounted to between 0.3 and 97.2 times the account balances. The larger the value, the more circumspection is needed in liquidity management in order to avoid momentary gridlock.

Queuing involving large amounts became frequent, with banks waiting for each other to provide the necessary liquidity. Queued transfers increased in both value and number, as shown in Charts 2.2 and 2.3.

The number of queued payment orders appears to be increasing month by month.

Queuing in value terms peaked in June (at HUF 1,384 billion), particularly in respect of transfers initiated by customers. The next two months witnessed a drop in the forint value of queuing, simultaneously with an increase in the share of bank-to-bank payments (HUF 812 billion in July and HUF 1,133 billion in August). The reason for this change in the ratio is that, due to a revision in rules, payment instructions by non-resident banks (acting as customers of VIBER participants) are recorded (under the international S.W.I.F.T standard) in terms of bank-to-bank transactions.

Management of payment orders initiated by non-resident bank customers of VIBER participants was not uniform. (The source of the problem was that orders entered on behalf of customers were only accepted until 1200 hours,[1] and those for bank-to-bank transfers until 1400 hours. In the latter case, an unexpected transfer instruction or incoming payment will cause an irrevocable change in a bank's end-of-day position.)

VIBER's operating hours appeared to be too short, with non-resident banks being accustomed to longer hours. The difference between time zones relative to London or North America posed some additional difficulty. Thus, foreign customers exerted great pressure on the system's operators to have the opening hours extended.

There was also a rise, relative to the previous period, in the frequency of the need for overnight central bank credit, due to non-repayment of the intraday credit by the end of the day. While this happened on only three occasions amounting in total to HUF 2.1 billion in 2000, during the months of January to August 2001, banks received a total of HUF 14.8 billion in end-of-day credit on 11 occasions, including a credit extension of HUF 11.1 billion in the month of June alone. This large value reflects liquidity problems arising in the aftermath of foreign exchange liberalisation, when some banks had to rely on central bank credit to fill in their end-of-day liquidity shortfall.

[1] Operating hours have been extended by 2.5 hours since 17 September 2001.

Liquidity management in payment systems

Banks' liquidity (funds) is determined by their account balances with the central bank combined with the intraday credit (limit[2]) available free of charge. The amount of the account balances in turn depends on the ratio of the reserve requirement.[3] The banks set the starting amount of the limit prior to the start of overnight ICS processing, and this cannot be altered until VIBER opens (at 0800 hours). During VIBER operating hours the amount of the limit can be changed as desired at any point in time depending on the amount of securities tied up at KELER (that is, the bank can instruct KELER to raise or lower the cover, provided the bank is not borrowing using those securities as collateral). With not all banks creating limits, in general the number of limit-makers ranges from 18 to 23, amounting to an average of HUF 44 billion per day in 2000. The number of the banks which changed the limit was not high either. During the first half of 2001, limit setting started to become more widespread. The extent of limit use seems to be associated with the banks' average access to covering balances (in other words, banks whose average account balances fall short of the daily average of debit transfers are more likely to set limits).

Chart 2.4 shows monthly changes in daily limit sizes.

***Chart 2.4* Limit created by the banks (intraday credit facility)**

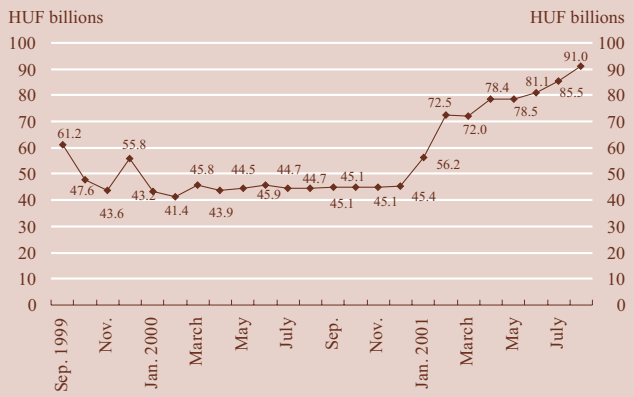
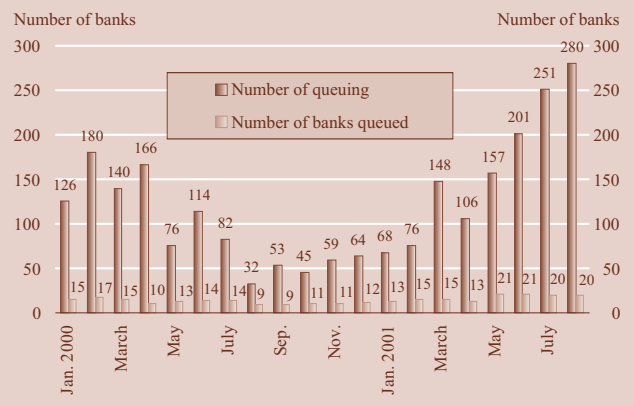


***Chart 2.5* Number of queues and queueing banks**



Should a bank's account balance be in debit at the end of the day, which entails that the intraday credit facility becomes an end-of-day credit, the central bank will extend overnight credit collateralised with the securities. The bank has automatic access to this overnight credit up to the amount of its end-of-day debt. It is also allowed to request credit in excess of the amount of the debt (but remaining below the limit), if so required by its end-of-day position (in respect of satisfying the reserve requirement and the availability of sufficient covering balances for overnight BCS transfers).

Payment orders that have insufficient covering balances are queued up. As liquidity management is not possible during overnight ICS processing, in the absence of sufficient covering funds, payment orders still being queued can only be processed the following day, with the necessary covering funds raised and settlement completed through VIBER. In 2000, banks queued transfers during the overnight ICS processing on 15 occasions for a total of HUF 13.4 billion, while during the first eight months of 2001, the corresponding figures were 12 and HUF 109.7 billion, respectively, due largely to calculation error. During the morning hours of the following day all queued payment orders were settled in ICS processing.

The group of banks queuing in VIBER was relatively stable. Chart 2.5 shows the number of queues in 2000 and in the first eight months of 2001 (with more than one payment orders queued at the same time; figures exclude the Hungarian Post Office, which has no customers).

Banks' liquidity management is impeded by the following factors:

- discrepancy in the interpretation of rules or unfamiliarity with the rules;
- withholding of payment orders;
- submission of customers' transfer instructions after the deadline;
- abstaining from the use of the intraday credit facility;
- difficulty in monitoring positions.

Discrepancy in the interpretation of rules or unfamiliarity with the rules

Payment system rules serve to help banks in successful liquidity management. The intraday credit facility (limit) and the possibility of changing it serve the same purpose, being a simple facility not requiring repo or deposit transactions. Thus, it can be applied outside VIBER operating hours, when the interbank market is already shut down and there is no access to central bank repo. The intraday availability and use of this credit facility is free of charge, and the bank receives the interest on the securities provided as collateral.

Banks interpreted the rules to mean that they were able to send new payment instructions during the one hour designated for returning customers' payments, and that after

[2] Equal to the value of securities held at KELER which the bank offers as collateral for the intraday credit facility provided by the National Bank.
[3] The reserve ratio, set at 11 per cent in 2000, has to be satisfied on a monthly average basis.

1300 hours they were allowed to use the MT 202 message to send in their customers' orders received after this hour or payment orders for which the customers provided covering funds at a later time.

Some VIBER participants are either not familiar with the enquiry messages or are not able to use them.

Withholding payment instructions

A bank withholding payment orders until it has sufficient funds, that is the use of internal queuing, is definitely harmful for the system. If payment orders are dispatched without delay and queuing is centrally located, this will not only reveal any systemic liquidity problems, but also enables the automatic breakdown, and eventual settlement, of a gridlock. There are only verbal reports suggesting that a number of banks regularly queue orders inside their own systems, and checking the actual situation is only possible on-site. Another reason why this procedure does not appear to be desirable (when the customer has sufficient covering funds for settlement) is that banks have a contractual obligation to act on their customers' instructions within two hours. Furthermore, such procedures are also adverse for international correspondent banking services, the development of which has been gaining momentum of late. Non-resident banks frequently advise beneficiaries directly (i.e. confirm payment orders in a separate message) if they want to initiate instructions promptly. If a Hungarian correspondent of a non-resident bank does not enter the instruction into VIBER, then it is questionable whether the foreign bank has really initiated the instruction.

After-deadline submission of customers' payment orders

The problem of sending in customers' payment orders after the deadline is a complex issue. Prior to 17 September 2001, the cut off time for accepting customers' instructions was set at 1200 hours (compared with 1430 today), and acceptance technically ended at 1300 hours. This left VIBER participants with plenty of time to take care of their end-of-day positions and use bank-to-bank or securities transactions, or central bank repos, to raise the covering balances for their night-time ICS obligations. The assumption here is that the bank will not receive a large-value payment on its account shortly before the system closes down, nor will it be forced by its own customers to send in orders shortly before closing time, which is in contravention of the rules. At the same time, those payment orders that were entered earlier but are still being queued may be settled at any time before closing time, but this will not surprise the bank (if necessary caution is observed), as it has access to information about queued incoming payments. However, it has also occurred that banks initiated not only return payments between 1200 and 1300 hours, but also new transfers (which was technically possible as the system's acceptance time for MT 100 customers' payment orders only ended at 1300 hours). In addition, payment orders were also sent in on behalf of customers, "disguised" as interbank transfers, between 1300 and 1400 hours.

The worst procedure is to enter orders in the guise of interbank payments, without supplying detailed information about the customer. (The central bank has no means to detect such activities, as only those details of funds transfer orders are entered into the Central Accounting System of VIBER that involve the central bank.)

Abstaining from the use of the intraday credit facility

Even though intraday credit is in excess of HUF 100 billion, many banks do not use this facility. This could be attributed not so much to a lack of collateral as to unfamiliarity with this opportunity, since they had no need for it previously.

Difficulty in monitoring positions

When liquidity is scarce, banks are under especially great pressure to monitor their positions. Theoretically, they can obtain an accurate reproduction of their accounts – provided their S.W.I.F.T. connection is operating – from the messages about settled transfer instructions and enquiries. Incoming payments being centrally queued inside the VIBER because of insufficient covering balances may be monitored only by frequent enquiries via S.W.I.F.T. messages or phone to the National Bank's account managers. Banks can use a bilateral telephone connection to make enquiries about funds transfers not entered by a sending VIBER participant.

Banks that have no independent S.W.I.F.T. gateways and are linked to VIBER through their non-resident parent bank often have difficulty in the real-time monitoring of positions. The lack of independent connection is also a disadvantage in respect of other areas, such as testing or modifying the system, as well as problems arising if banking holidays are changed.

A consultation with the banks clearly shows that the ability to better monitor payment flows would contribute to improving the standard of liquidity management in real time.

Changes needed in system rules

Another difficulty seemed to be in the ordering of the payment messages non-resident banks had initiated with VIBER participants, as such instructions were viewed either as bank-to-bank or customers' instructions on a mixed basis. The main difference is in the acceptance deadline and the applicable crediting rules. The payments typically involve large-value payments that should be settled as interbank payments (being MT202 messages sent by banks) according to the S.W.I.F.T. standard. On the other hand, they are not transactions banks make on their own behalf so, involving large-value transfers, if they are initiated late during the day, they may interfere with the end-of-day positions of the sending and receiving banks. This issue had to be clarified in the VIBER rules, involving an extension of the standards book.

The National Bank's opening hours did not exactly correspond to the operating hours designated for the system. It opened earlier and, more often than not, closed consid-

erably later. Thus, banks could not know for certain if they would receive any other payment messages after the system's official closing time.

Central bank measures

The combination of the aforementioned factors led the Bank to recognise the need for amending certain VIBER rules, which eventually led to a two-step revision in co-ordination with the banks.

In the first step, in August 2001, the NBH made some clarifying amendments to the VIBER rules. Resident credit institutions associated with VIBER through another VIBER participant are viewed as indirect participants, while non-resident banks initiating a payment through VIBER participant banks are regarded as customers. This rule serves to ensure that no unexpected large-value transfer instructions are entered shortly before the end of operating hours.

There have been further changes effected from 17 September 2001. As a result of extending the operating hours by two and a half hours, payment instructions are now accepted

- until 1630 hours for bank-to-bank payments;
- until 1600 hours for the monetary settlement of securities transactions made by KELER;
- until 1430 hours for payment instructions initiated by customers, with another one hour provided for the return by VIBER of any mistakenly transferred funds.

Simultaneously, the period when the central bank service is available for settling banks' end-of-day positions was also extended:

- overnight deposits can be placed with the NBH until 1630 hours,
- overnight repo transactions can be made with the Bank until 1530 hours.
- intraday credit facility can be requested until 1645 hours (that is after VIBER is closed, explicitly for the purpose of overnight borrowing) by placing collateral in the form of securities held by KELER and accepted for the purpose of central bank repo transactions.

In connection with the extended operating hours, the Bank has amended the NBH Decree 6/1997 on the circulation of money. The acceptance deadline for customers' instructions for payments was extended from 1200 to 1430 hours. According to the regulation, credit institutions are required to credit the transaction amounts that arrived until 1430 hours instead of the former 1200 hours to the account of the recipient to render such funds available for payment orders scheduled to be forwarded to the credit institution clearing house (ICS) on the same day.

Effect of the revisions in September 2001

In the aftermath of the above measures, the extended operating hours have facilitated balanced payment flows during the day, with no sign of end-of-day accumulation of orders. The number of queued transfers has remained high, but this apparently involves smaller value transfers. September saw no end-of-day credit extension, and there were no more complaints filed by banks on account of other banks' irregular activities. In September the system did not reject any customer payment orders because they were initiated after the closing hour, which implies that the banks were able to send orders on the same day and within the deadline.